

WHERE NOT TO BUILD a guide for open space planning **TECHNICAL BULLETIN 1**

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Gratitude is expressed by the authors for cooperation and assistance from the following:

Bureau of Land Management Staff
JAMES E. KEOGH, Utah State Office
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This study was prepared under a Contract from the Bureau of Land Management, Department of the Interior, Contract Number 14-11-0006-71. Their interest in this study was prompted by concern over the impact of urbanization on public lands and the responsibility entrusted to the Bureau of Land Management for utilizing these lands according to the best public interest. Gratitude is expressed by the authors and the Institute of Urban Studies and Services for cooperation and assistance received from the BLM staff during the preparation of this study.

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CONTENTS

PART I—A THEORY OF OPEN SPACE

	<i>Page</i>
Introduction	3
The Case for Open Space	5
Concepts of Open Space	17
Classification of Open Spaces	25
Guides and Standards for Open Space Planning	37
Application of Open Space Planning	59

PART II—THE WASHINGTON COUNTY CASE STUDY

Verification	75
Application of the Open Space Concepts to Washington County, Utah	77
Data Collection	85
Usefulness of Open Space Planning to Field Personnel – an Evaluation	91
Appendix	97

FIGURES—PART I

1. Continental Scale Water Resource Plan	31
2. Alternates For Subdividing	44
3. Comparison of a Conventional Subdivision and a Cluster Subdivision	45
4. Rectilinear Grid Subdivision: Salt Lake County, Utah	45
5. Curvilinear Grid Subdivision: Salt Lake County, Utah	46
6. Advantages of Cluster Design	47
7. Preservation of the Natural Landscape: New Seabury, Mass.	48
8. Planned Unit Development: Pomeroy Green, California	48
9. Planned Unit Development: High Meadow, California	49
10. Planned Unit Development: Santa Cruz Campus, California	50
11. New Town Development: Reston, Virginia	52
12. New Town Development: Columbia, Maryland ..	52
13. Creek as Unifying Element of an Open Space System: Santa Clara, County	66
14. "Emerald Necklace" Open Space System of Cleveland, Ohio	67
15. Open Space System of Washington, D.C.	67

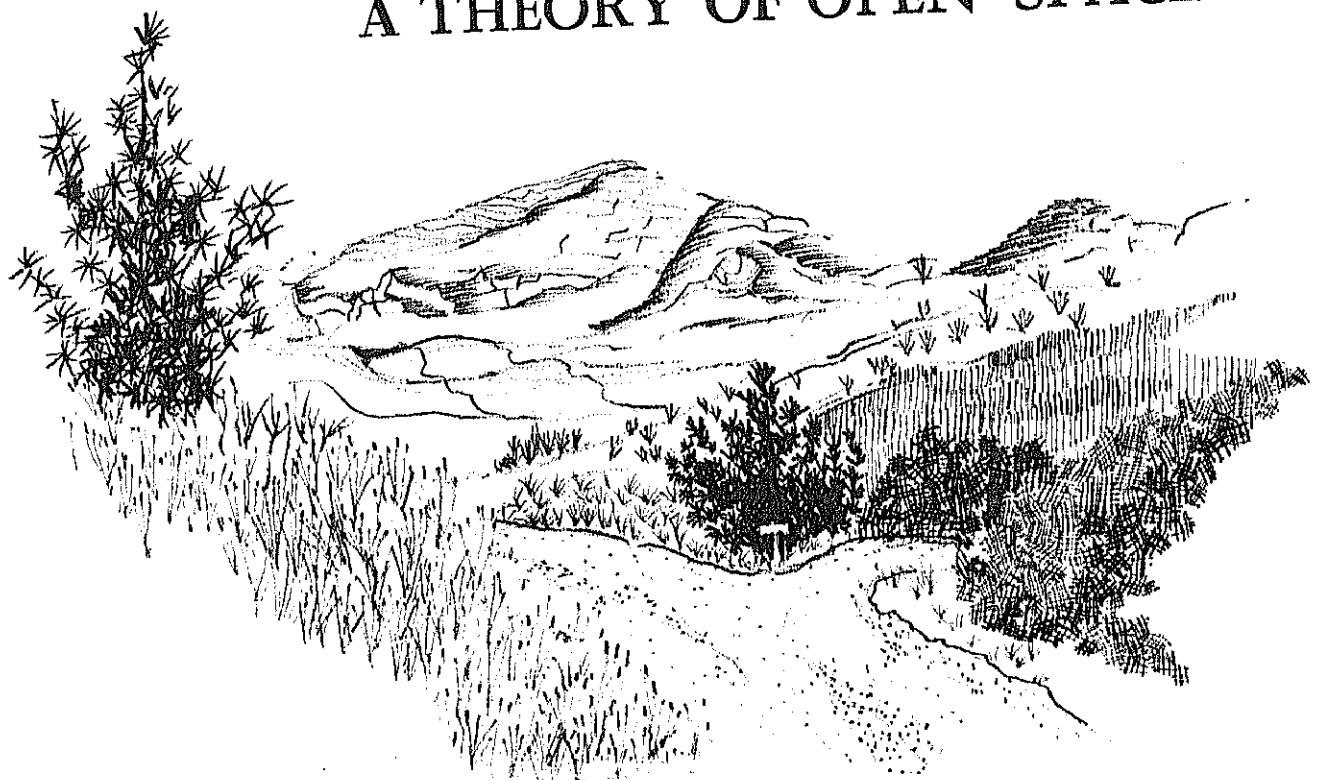
FIGURES—PART II

	<i>Page</i>
Washington County Open Space Framework	78
Virgin River Diagram	79
Dixie National Forest Diagram	79
Zion National Park Diagram	79
Dixie State Park Diagram	80
Interstate Highway 15 Diagram	80
Other State and Federal Highways Diagram	80
Communities	81
Water Sheds Diagram	81
Agricultural Lands Diagram	81
Multiple-Use Lands Diagram	82
Base Diagram of St. George	82
Basic Micro Open Space Framework: St. George	82
Extension of the Open Space System: St. George	83
Open Spaces of the Community: St. George	83
Continuity of Open Spaces: St. George	83
Bluffs: St. George	84
Corridors: St. George	84
Red Cliffs Recreation Site: Washington County	92
Spoilation of Bluffs Surrounding St. George	92
St. George Golf Course Sited in a Natural Drainage Channel	93
Washout of a Canal Constructed Across a Natural Drainage Surface	93
Highway Billboards Juxtaposed Upon a View of Scenic Importance	93
Overlook from Little Creek Mountain—Without Visual Interference	94
A Golf Course, A Gravel Pit, and Stock Corrals—All in the Same View	94
Junk Yard on Open Land	94
Auto Wrecking Yard Competes with a View	94
Despoilation Resulting from Gravel Removal for Highway Construction	94
Restoration after Removal of Gravel for Highway Construction	95
Mining Overburden Carelessly Dumped	95
Appendix A: Geographical and Topographical Distances from Population Center of the State	101
Utah Topographical Map	102
Washington County Topographical Map	103
Utah State and Washington County Land Areas	104
Land in Utah	105
Appendix B: Land Use	
Generalized Land Use Map of Washington County	115

	<i>Page</i>		<i>Page</i>
Appendix C: Demographic			
Population Growth: State, Salt Lake County, Washington County	119	1870-1966	145
State of Utah Density—Persons Per Square Mile of Land Area	120	Appendix E: Planning Data	
Washington County: Population Density & Distri- bution—1960	121	State of Utah: Distribution of State Parks	149
Washington County: Population Density & Distri- bution—1960 (computer printout sample)	122	Washington County: Proposed Dixie Reclamation Project	150
		Washington County: Watershed Areas	151
		Washington County: Mineral & Recreation Re- sources	152
Appendix D: Land Ownership			
State of Utah: Generalized Land Status Map	125	TABLES—PART I	
Federal Land Grants to State of Utah	126	1. Areas For Recreation Development	39
State of Utah: Federal Railroad Grants	127	2. General Standards For School Site Sizes	40
Washington County: School Land Grant—(1896)	128	3. Minimum Rights-of-Way Widths For Rural Sec- tions of Interstate Highway System	40
Washington County: Land in State Ownership —1965	129	4. Crude Standards For Estimating Space Require- ments	41
Washington County: Public Lands BLM Admin- istered—1965	130	5. Residential Densities Recommended by the Amer- ican Public Health Association	42
Washington County: Public Water Reserves—1965	131	6. Comparative Residential Subdivisions	43
Washington County: Land in Private Ownership —1965	132		
Washington County: National Forest Lands	133	TABLES—PART II	
Washington County: National & State Parks	134	7. Incorporated Areas By County: State of Utah	155
Washington County: Indian Lands (Held in Trust)		8. Population and Density: Washington County	155
Washington County: Private Land Selections—		9. Population—1890-1960: Washington County	156
1870-1879	135	10. Population Change—1890-1960: Washington County	157
1870-1889	136	11. Land Selections and Sales By The Utah State Land Board: State of Utah	158
1870-1899	137	12. Land Selections and Sales By The Utah State Land Board: Washington County	159
1870-1909	138	13. State Parks in Utah	160
1870-1919	139	14. National Forest Lands: State of Utah	160
1870-1929	140	15. National Forest Lands: Washington County	160
1870-1939	141		
1870-1949	142		
1870-1959	143		
	144		

PART I

A THEORY OF OPEN SPACE



*Variety
Washington*

The great open spaces of the West, including vast stretches of mountains and deserts considered to be wasteland, are now also in the path of urbanization, for as the small city merges into huge regional metropolis, urbanization takes in whole territories in which the open spaces, once remote and "non-useable", become part of the great urban complex. Open space is thus no longer the undeveloped territory outside the city, but a part of the great developing urban complex.

OPEN SPACE PLANNING

Open space, quite simply, is a land or water surface open to the sky. It may be land used for farming or other extractive purposes, land used for parks or used for its natural features, for purposes of view, wildlife, or conservation. It may be used for routes of movement or places of landing.

What is characteristic is the openness to the sky. The spaces around buildings—the landscape—the bodies of water and the waterfronts of lake and stream—the plazas and streets—the farmlands—are all open spaces and have functional uses as open space.

Up to now, open space—the land left open to the sky, the land not built upon—has not been considered a prime determinant in planning. In general, the approach has been made on the side of the building site. Planning has addressed itself first on the problem of where to build.

This handbook is a guide to planning where the prime determinant is the open space. It seeks to establish first the concept of open space as a functional land use, and gives an outline of how open space may be classified as a functional land use coordinate with the classification of land uses of building or develop-

ment use. It also suggests how open space may be used as a control or structure for planning—"the armature of the plan," and suggests some guides and standards to follow in open space planning as part of comprehensive planning.

It gives emphasis to multiple use problems and to open space systems. And it provides a basis for incorporating the planning process as a fundamental part of land management.

Quite clearly now, planning is a necessary requirement in management, for land as well as for the rest of man's business. When public land is to be retained, released or sold, its disposition should be based on a planned program. Its use should be determined as fitting into a comprehensive plan where open space is a clearly organized element of the plan. If land is disposed of without a planned use, the errors of the past are free to continue at a time that does not allow the elbowroom of mistakes that existed in the past. Locally, regionally and nationally we are more in danger of committing mistakes that will become progressively more expensive to correct than ever before.

The need for planning is certain and open space planning can provide the tool for effective and meaningful planning in the use and management of land for the smaller site and the larger area.

It is to provide a working basis of concept and application in open space planning that this handbook has been prepared. The emphasis is primarily in the urban context, with the impact of urban growth on open space lands, used and unused. The principles and classification system developed may be applied at any scale and to rural as well as the urbanized and urbanizing areas. In the rural and non urban areas generally, open space planning is of particular importance, not only to meet problems of urban development that may impact them but also as a way of developing a consistent and sound approach to use and management of non urban land for now and the future.

THE CASE FOR OPEN SPACE

WHO WANTS OPEN SPACE?

The concern for open space and open space planning has risen because of the enormous growth of population and the impact of urbanization, resulting in a vastly increased demand for land for urban purposes, and an intense competition for the use of land everywhere. The concern extends to lands remote from population centers: the aesthetics of highway planning in open countryside, the prevention of environmental pollution, the preservation of scenic values and the conservation of natural resources are all part of the public interest in open space.

PEOPLE, PEOPLE EVERYWHERE

The World Explosion

It is estimated that the world's population first reached the billion mark about 1850. Only 75 years later, in 1925, there were 2 billion people on earth;

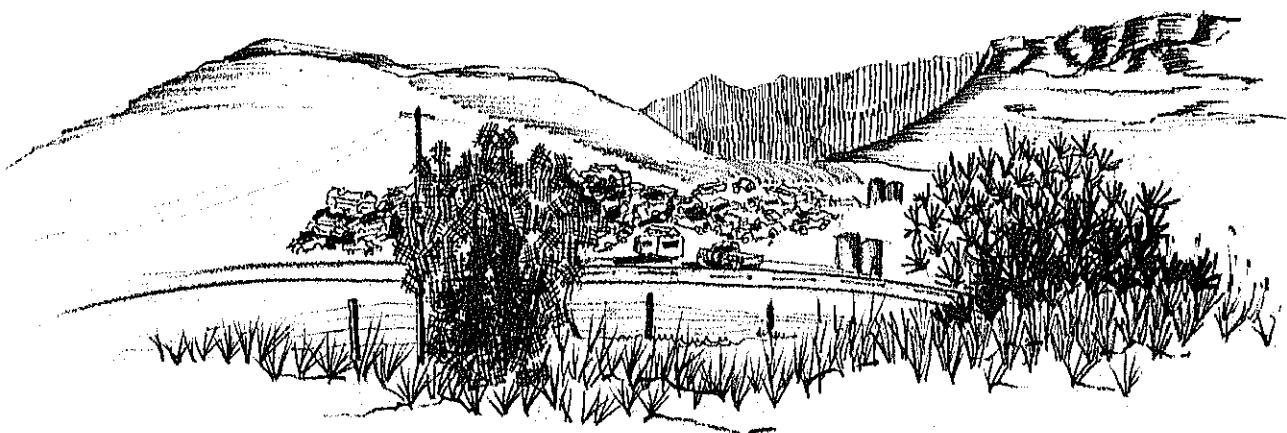
and to reach the third billion took only till 1962, an additional 37 years. With present trends, it will take even less—some 15 years—to get 4 billion and in less than 10 years after that to reach 5 billion.

It is not merely the sheer numbers but the fantastic rate at which the world's population is growing. The present rate of two per cent increase a year, if continued, "would produce close to one person for every square foot of surface on this globe in 6½ centuries . . ."

. . . and in the United States

In 1850, the United States had about 23 million people. Thirty years later this had more than doubled; in 1880, the number had reached about 50 million. It doubled again by the 1920's and the population is now again near double the size of that period.

The population explosion continues. By the year 2000, over 300 million, more nearly 350 million, it is estimated, will be living in the United States. In the 1850's the U.S. had a land area averaging 82.6 acres for each inhabitant; by 1900, this had shrunk to 25.5



Junkyards destroy or diminish that which may have been a pleasant view.

acres and by 1950, much further to 12.8 acres per person. By 2000, it is expected that this figure will shrink even more to something over 5 acres.

Where Are These People

The world-wide population explosion is largely urban. In the U.S., it is also an urban explosion. In 1790, when the first census was taken, there were only 24 urban places of 2,500 or more inhabitants. By 1960, there were over 6,000 urban places, containing about 70% of the total U.S. population.

Not only are the greater number of people living in urban places but the greater number are living in metropolitan areas. Between 1900 and 1960, while the total population of the United States somewhat more than doubled, urban population almost quadrupled, metropolitan areas more than quintupled. By the year 2000, fully three quarters of the people will be living in vastly expanded metropolitan areas or urban regions.

In 1900, it is estimated that of a total of 1.9 billion acres, 6 million were in urban development. By 1950, the estimate was 17 million acres in cities of 2,500 population or more. From 1950 to 1960 urbanization was consuming land at the rate of over 1 million acres a year. By the year 2000, it is projected, there will be over 40 million acres of urbanized land, an increase in this use of some 250% over 1950. More important than amount is the kind and location of land to be used for urban purposes. The demands on land of an ever increasing urban population will require large areas of regional scale, including more than building sites alone.

In the past, one of the consequences of the spread of urban expansion has been a somewhat wasteful development of land. Land has been left as vacant, often denied for other uses, but potentially available for urban development in a haphazard pattern of open spaces within the growing urban area. In the future, unbuilt-on land, not as leftover, but planned for open space uses, will be part of the total urban land requirement. The continuing population explosion predominantly in the large metropolis and urban region will put a demand on land well beyond the minimum needed for building as such.

Moving On And Out...

The vast increase in population has been accom-

panied by a great increase in mobility. Movement to other places is long in the history, even tradition, of the country. People moved on to newer, if not greener, pastures, opening new land, sometimes settling sometimes again moving on.

Fantastic changes in transportation have only accelerated what has been characteristic. The railroad later the motor car, now the airplane, make possible more frequent as well as faster moves, covering longer distances in less time.

It was inevitable that people not only moved or to other locations, but they could move out quickly from the same center. The automobile by itself did not create the suburb, but it suburbanized the city far more rapidly.

There has thus been a double pattern of population movement within the population growth: the continued movement to the more open country to the west, and the explosion outward from the cities everywhere to the outer city reaches.

Along with these movements there developed a third pattern of movement, the flow of people from the countryside to the city as people left farming and the land for industry and jobs in the city.

The total impact of growth and movement has been in the great agglomeration of people in large metropolitan areas. Even more there has grown up the urban region of vast scale taking in a number of metropolitan areas. These are not confined to the eastern part of the country such as the Boston-New York-Philadelphia, Baltimore-Washington complex, but are developing in the west as well. In the San Francisco-Los Angeles-San Diego complex—in the Seattle-Tacoma-Portland area—in the Ogden-Salt Lake City-Provo region and others large and a little less large.

... To the Open Spaces

The increase in population has been attended by other changes in age groups, family size, and change in work. All of these, together with sheer increase in numbers, are part of the forces of invasion into the open spaces.

The most rapidly growing segment of the population is in the 18-24 year age group, but the proportion of people over 65 continues to rise. We will have more and more of the older citizens in our midst along with the rapid increase in children.

Households have grown more rapidly than total population, while the family size has become smaller.

Households tripled between 1900 and 1960 because of younger marriage age and greater income among other things. Between 1960 and 1976 it is expected that the number of households may increase by some 13 million, or 25 per cent; and between 1960 and 2000 by some 44 million or 83 per cent. Each of these households will require space not only in terms of total numbers of household units: the number of yards, automobiles, parking spaces, recreational and other facilities increase significantly in demand according to the increase in family units.

The effect of population change and movement on open space land is reflected less in the total amount of land needed for open space purposes, perhaps more in the location of open space and its relation to the great metropolitan areas, spread and spreading as they may be. Even with greatly expanded transportation means, with the farther reaches available more quickly and easily—the immediate great needs will be in and near the urban regions.

Ultimately, however, open space requirements will reach into the far corners as a result of the huge increase in total population, the increase in households, the continued mobility of the population. The city will reach farther and farther into the country—not only for dwellings and work and business, but for recreation and change. More land will be needed for building. Even more land will be needed not for building.

CHANGES IN THE ECONOMY

The tremendous growth of the U.S. economy has been marked by a major change in character—from a predominantly rural-agricultural-extractive economy to a predominantly urban-industrial-service economy. The change continues to place great demands on our land, water and space resources.

Technology has made possible great advantages in the use of land. In farm production alone, it appears that technological improvement could make possible the 120 per cent increase needed by the year 2000 from the same cropland acreage available in 1960—if the same amount would still be available with more than a million acres a year being diverted to non-farm use.

Other demands are mounting. It is estimated that land needed for homes, schools and factories for the year 2000 will be up 215 per cent from 1960, for

transportation up 125 per cent, for reservoirs up 180 per cent, for user-oriented parks a fourfold increase in demand.

—As An Example

The effect of the changes that have taken place in the economy may be seen in the example of land used for industry. Old manufacturing facilities and related development were tied in with local power resources such as water power in New England. Buildings were multi-story, located on river banks often on uneven terrain. The homes of the workers were in the community. The home-to-work journey was on an intimate scale measured by walking rather than vehicular transit or other major transportation systems.

Even in later development of manufacturing in the central areas of cities, with the coming of other power resources, land was used intensively in multi-story buildings, and workers could live nearby or use local transit systems.

The industrial land pattern has changed considerably. The plants themselves are laid out as single story buildings, preferably on flat land, sometimes occupying acres of square feet under roof. Huge areas are needed for parking and road transport, even more than for former railroad requirements. Mammoth scale of production and distribution require warehouses, truck terminals and a host of other industrial services. Employees are not concentrated in the area of the plant but may come from widely dispersed points, extending the influence of the industrial plant in land use over a great area.

Along with the changes in size and type of land uses, the changes of a scientific-research based industry go along with other changes in the economy, such as the development of new power resources and networks. The changes in transportation from railroad to highway networks and in communications make possible different kinds of development and exploitation of natural resources. When some remote areas were not thought of as being in the industrial complex, now even the most unlikely areas—some considered wasteland—are now reachable and reached for, as in the case of shale oil lands.

Shifts that take place in the use of resources—coal to oil and gas, or water for agriculture to water for industrial use—not only have opened up new areas for industry or industry-related uses, but compete for land formerly used for other extraction—oil and gas

fields in farming areas, for example—the changes have not only opened new areas, but increased competition for use in existing areas.

Increases in Demand for Land

Thus the changes in the economy have increased the demand for land and have increased the competition for land among uses. The housing development or the shopping center replaces the farmland. Factories, warehouses and truck terminals now grow where cattle once grazed.

What is of greatest significance in the total increase is location as well as type and amount of use. Uses are not always interchangeable—an orchard displaced by housing cannot be put just anywhere.

The total impact is that areas and land formerly thought of as being unneeded, or wasteland, or left to existing or non-use, are now in the offing of demand.

ness and the general character was one of mix, a mixture of uses, types and activities.

In time, as population increased and as the economy changed, there was the growth outward in concentric patterns and this has continued generally in suburban development. Growth outward was generally continuous, eating up the open land at the periphery, often without regard to open space features that might best be left as open space use. Development took place in a pattern of not only most easily available land but most easily developable. Arable land of great productivity was frequently taken out of agricultural production and given over to housing and industrial development. Flood basins were invaded not by water but by houses or roads.

The spread and relative chaos of a somewhat indiscriminate scattering, lengthening times of travel from home to work, the eating up of the open countryside and the intensive competition for land has brought into debate what the pattern of urban growth should be, whether of extreme dispersion or concentrated density, continued spread or tighter clustering with less private open space, balanced by systems of continuous open space, publicly or commonly owned. Out of the debate on urban patterns there has come greater interest in the large scale unit development and new town concepts.

If the trend can be marked at the present, the urban patterns may be developing as a series of cluster developments, whether of large scale units or new towns, each with a strong nucleus of community facilities. Into this pattern, a positive system of open space is needed to provide continuity, linkage and identity of the parts in themselves and to the whole.

URBANIZATION

All indications are that urbanization will continue with greater intensity and spread in the foreseeable future. As technology in transportation, communications, and industry develop further, the penetration of urban development can be expected to move further in the public land states, competing for land considered uninhabitable in the past and for land used for grazing, mining, and agriculture. An understanding of urbanization, its patterns and problems is vital to those dealing with the public lands.

Urban Patterns, Past and Developing

In its simplest terms, the urban pattern of the past was built around a center (whether of village, town or city) surrounded by the open countryside. Open space was immediately on hand at the close edge of the fairly compact, relatively small-scale urban center.

The existence of the city was physically manifest in city: temple, palace, cathedral, market.

The sizes of the cities were limited in the core, or by the

ence, a place of exchange, their work or busi-

The Little and the Big

Until fairly recent times, cities, with few exceptions, were small—at the beginning of the eighteenth century, cities rarely had more than 25,000 inhabitants, the city at this scale was on the whole comprehensible, the population was more or less stable, there was a generally clear distinction between the city and the countryside beyond.

The city as we have come to think of it is more a product of the nineteenth century, transformed by industrialization, great geographical expansion, phenomenal increase in population, especially by immigration from near and abroad, and considerable changes in the physical conditions. The city has reached out into the countryside into suburbs.

Although the city is thousands of years old, the metropolis itself is a fairly new phenomenon of the twentieth century. If nothing more, its size alone makes it a new condition of urban life, extending the reaches of the city over great territory and taking within its complex numbers of communities and smaller city developments. The metropolis continues to expand and envelop even larger areas and it is freely expected that by the end of the century will develop into huge urban regions which in physical extension and urban influence will cross state lines, reach over mountains and enclose great areas of open space as well as built-up spaces.

The Small City

There are still numbers of smaller cities, old and new, which are not of regional scale, yet are of great significance in the total picture of urban growth and urban land demand. There are also following patterns of spread and scatteration. In some cases, particularly in the west, they are extending through territory to great distances. One U.S. city, Oklahoma City, already has over 600 square miles within the municipal corporate limits, with a population about 525,000, as compared with a metropolis such as Los Angeles with the area of under 500 square miles and over 2,500,000 population within the city.

Particularly in the Western States, even the very small cities continue to expand and extend their territorial limits, often without regard to expansion and extension of adjacent cities. There is not only competition for the use of land but also for jurisdiction. It is in this kind of competition, joined sometimes by county jurisdictions, that control of development and the planning of open spaces presents difficulties beyond simple designation of best land uses.

The Metropolitan Area

In the 11 Western States (Hawaii and Alaska not included) there were 16 standard metropolitan areas listed in the 1950 Census. In 1960, 26 were so listed, with 10 counted 500,000 population or more (areas with central city of 50,000 or more). These urban areas not only include great aggregations of people but large expanses of territory, taking in numbers of other cities and communities and sometimes whole

counties. They continue to grow in size of population and territorial influence and are even more significant in the impact being made on the public lands.

The areas listed in 1960 are:

	<i>Population</i>
Albuquerque, New Mexico	262,199
Bakersfield, California	291,984
Billings, Montana	79,016
Colorado Springs, Colorado	143,742
Denver, Colorado	929,383
Eugene, Oregon	162,890
Fresno, California	365,945
Great Falls, Montana	73,419
Las Vegas, Nevada	127,016
Los Angeles-Long Beach, California	6,746,356
Ogden, Utah	110,744
Phoenix, Arizona	663,510
Portland, Oregon	821,885
Provo, Utah	106,991
Sacramento, California	502,778
Salt Lake City, Utah	383,035
San Bernardino-Riverside-Ontario, California	809,782
San Diego, California	1,033,011
San Francisco-Oakland, California	2,783,355
San Jose, California	642,315
Santa Barbara, California	168,962
Seattle, Washington	1,107,213
Spokane, Washington	278,333
Stockton, California	249,989
Tacoma, Washington	321,590
Tucson, Arizona	265,660

Urban Regions

Even more significant in the impact of urbanization are the larger agglomerations of people and economic activities in which the separate and separated city is submerged in a regional complex. Some of the standard metropolitan areas are contiguous, such as the Los Angeles-San Diego-San Bernardino areas, and in themselves form a region. Others grow toward each other to form other regions such as the Ogden-Salt Lake City-Provo complex. Still in the formation as even larger regions, a few can now be marked out as present major influences over huge areas of land in development and in open space:

Seattle-Tacoma-Portland in the Northwest
 Sacramento-San Francisco-Oakland-Stockton-
 San Jose-Fresno in California
 Los Angeles-San Bernardino-San Diego in California
 Ogden-Salt Lake City-Provo in Utah
 Denver-Colorado Springs-Pueblo in Colorado

ON THE MOVE—MOBILITY AND TRANSPORTATION

At the heart of the open space problem in relation to urban growth is the phenomenal change in the mobility of persons, power, and production. The handmaiden of urban sprawl has been fast and relatively cheap transportation. The automobile has and continues to change the character of the city and metropolis. It has removed the restraint on city size, it has spawned highways anywhere and everywhere and opened up areas near and remote for visiting and development. The vast production of automobiles at a rate of 14 million a year promises to continue and extend access to all places.

The impact on the public lands and open spaces is evidenced by the intensive use of the national parks. Where formerly places seemed remote, they now seem to be penetrable. Mobility and a system of transportation based on the automobile and the highway have opened up land on a somewhat different basis, at a far faster rate, and for different uses than the great period of the opening of the west. It has brought urbanization into the open country and helped create in effect the urban region where internal movement compasses frequent trips of substantial distances. Distances shrink, areas expand and open up land to new uses. Access gives the potential for development and the urban influence reaches farther and farther out, bypassing areas easily if not at will.

It is precisely this ability to leap over space that offers a key to open space planning for it would be possible to plan appropriately for the best places to build and those best not for building. The automobile as an invader of open space could also be the means of planning properly for open space systems.

Corridor and Landing Space

The great advantage of the automobile is that it provides a "door-to-door" service. There must be not only the highway or road but also the landing place, the destination. While the amount of land taken by the roadways may not in the aggregate seem to be large in proportion to the total amount of land, the land adjoining and tributary to the road becomes a significant factor in land demand. Highways, particularly in the urban area, are potent competitors for land.

In city development from 20 to 30 per cent (in a number of places, even more) of the land is taken up with streets and roads. Every mile of super highway removes 50 acres of land from other uses. The parking spaces for automobiles take up about 300 sq. ft. per vehicle and vast acreages of land are needed for landing as part of the road system. Any collecting place—shopping center, recreation area, industrial plant—requires substantial areas of land for parking on the order of 150 parking places per acre.

Land for the corridor right-of-way and for the landing place both contend with the land for other uses, and real conflicts develop where highway uses are seen as intrusions on other land uses such as parks or residential areas—the conflicts not limited to the highly developed urban area, even if more pronounced there than elsewhere. The competition for land, as in other cases, is for land equally desirable for highways or parking spaces and other uses, including open space uses—flat or gently rolling land.

If the corridor and landing place could be seen as one kind of open space-rights-of-way and parking places becoming part of an open space system, much could be done to resolve conflicts and adjust competition for the uses of land.

THE EXPLOSION OF RECREATION

Two simultaneous and related developments in the years following World War II contributed to a recreation crisis which began to be felt in the mid 1950's. The effects of higher real incomes and greater amounts of leisure time coupled with the population explosion led to greater and greater demands in existing recreational facilities. At the same time, the building activity that had been put off during two World Wars achieved unprecedented levels beginning in the later 40's. The demands for schools, airports, highways, factories, and above all, housing, led to an extremely rapid consumption of readily accessible open land.

In 1959 the Outdoor Recreation Resources Review Commission (ORRRC) began a three-year study of national demands for recreation, resources available, and policies for future programs. Their reports led, in 1962, to the creation of the Federal Bureau of Outdoor Recreation, Land and Water Conservation Fund Act (1965), Wilderness Act

(1964), and finally in 1965 a Highway Beautification Act and important provisions for Urban Beautification in the Housing Act of 1965.

The study suggests:

" . . . a doubling of demand by 2000, even if participation did not increase. But it will. Studies of other trends indicate that in the years ahead the individual will be participating a great deal more in recreation than he does now . . . at least one-fifth of free time goes into outdoor recreation today . . . incomes will be higher . . . shifts toward more white-collar professional occupations will mean also a shift away from TV . . . the forecasts of travel suggest enormous expansion . . . the new degree of mobility should be impressive indeed, and among other effects, this will inevitably increase the pressure on recreation sites that now seem remote. . . the demand is pervasive. About 90 per cent of all American adults engage in some activity in the course of a year."

... and its Effect on Open Space

It is estimated that by 2000 the area of land in public outdoor use will be about 95 million acres, an increase of more than double the 46 million acres in this use in 1950.

RESOURCE AND ENVIRONMENT

Land is a fixed resource. It is fixed in place, in amount and it must be used where it is. It must be used and planned for future needs as well as present, for a constantly growing demand for more and better things and facilities to meet both the phenomenal increase in population and the changes of urbanization. Great demands will be made in the designation of land for development, for occupancy of more people and more building—and with this a demand on the designation of land *not* for building—for production—farming, grazing, mining—for parks and recreation and all other kinds of open space.

Along with the allocation of land is a demand for the improvement of the environment—quality as well as efficiency is sought in the use of land as a resource. In addition to the concern for the reserve of land for future needs and the wise use of the resource in the expansion of the economy, there is a concurrent concern for conservation, for preservation, for restor-

ing the misused and the spoiled, for curing and preventing pollution.

Pollution and Environmental Health

There has long been a concern for conservation and preservation. There is precedent and policy for saving land resources. There is still exercise and exhortation over exploitation. Today more than ever there is a conscious concern and the beginnings of action on pollution and the creation of a healthy environment.

Attention is being given to all forms of pollution—of water, air and of the land, for all are interrelated. Urbanization itself has contributed in a major way to pollution, especially in the eating up of the open spaces for building development.

Among other things, open space is a factor in environmental health, especially at the regional scale and even at the smaller local scale. The way the land is used, the way it is treated, the balancing of built and unbuilt upon land are all beginning factors in the creation of a healthful, non-polluted environment.

INTO PLANNING EVERYWHERE

Open space is a national problem. It is of concern and interest in all parts of the country and at all levels of society—"the words echo in the halls of Congress and in the State Legislatures." And it is the subject of national legislation. From local concern for a neighborhood park to state programs of recreational development to the problem of the use of the national public lands, it commands increasing attention. And it is becoming a vital element in planning for orderly growth and development.

The Rise of Planning

While planning has long been man's way, planning as we have come to know it in this country has a comparatively short history. The early new towns, particularly in the west, were planned simply in grid-iron fashion with rectangular blocks and streets, following the example of Philadelphia and Manhattan Island. This was the simplest way to divide

the land for sale of parcels and lots, little influenced by the example of Washington or the early New England town, and often with little regard for topography. Expansion, the giving of land grants and the haphazard growth of the 19th century gave little thought to the utopians and others who sought to create ideal communities and better ways of land development. Unplanned exploitation was more to the point.

A greater effect came in the parks movement, in the importance given to facilities and recreation, "to the necessity for lessening the discomforts of crowded streets . . . and to the relation which these things had to the proper laying out of the city."

The improvement and protection of water supply for the cities and the control of waste disposal, the protection of streams and reservoirs had the effect of preserving large open spaces outside of cities. At the turn of the century there was a much more conscious effort to plan for (1) sanitation, housing and park systems; (2) planning new towns and subdivisions; (3) civic design; (4) transportation and traffic. Zoning did not come until 1916.

City planning commissions came into being in the early part of the Twentieth Century and the first county planning commission in Allegheny County, Pennsylvania, was established in 1918, given official status in 1923. A Regional Planning Commission was established for Los Angeles County in 1922, and unofficial regional boards or committees were established for the Niagara Frontier, New York region and others. State and national planning did not finally get under way until the 1930's.

Acceptance of Planning

Planning has come to be accepted as a normal function in the conduct of public affairs. Official planning commissions and boards, planning departments are integral parts of municipal government increasingly of county governments, and there is a new surge of planning in the state government. Metropolitan area planning has been greatly advanced and cooperative planning organization has increased among cities, counties and other jurisdictions to deal with regional problems and on a regional basis.

The emphasis may vary at the various levels of government, the planning may be limited in certain fields of crossed jurisdictions, and the planning may often be of advisory nature rather than of legal jurisdiction.

Legislative Jurisdiction

At the local level, city or county, planning can be intimately tied in with specific legislation control or regulation as in zoning or subdivision control. Metropolitan or regional planning for which no corresponding governmental jurisdiction exists, may be only advisory or persuasive, with effectuation of plans or the exercise of regulation left to the local government. To meet the problem of the control and guidance of growth, some states provide for extraterritorial jurisdiction by local government, particularly in zoning and subdivision control, and also for cooperative planning by cities and counties. States also provide for the establishment of metropolitan and regional planning commissions as official agencies.

At the state level, the state planning agencies may prepare plans and studies on a state-wide basis and in some states also provide assistance, financial and technical, for local planning programs, both to support and encourage local planning and to help gear local planning to state-wide planning and development.

Comprehensive Planning

Most important is the development of comprehensive planning, comprehensive in area and comprehensive in coordinating physical, financial, economic and social problems in the planned development of the community. What has given force to the emphasis in comprehensive planning is the increasing requirement on the part of the Federal government that federally assisted projects be part of or consistent with a comprehensive plan. Thus the program aiding the acquisition of open land required that there be a comprehensive plan for open space. The assistance to states to plan outdoor recreation requires the making of a state comprehensive plan for recreation. As a basic principle for public expenditures, the requirement for a guiding comprehensive plan is being accepted at all levels and especially for those undertakings that involve several jurisdictions. Highways, water supply, flood control, air transportation, pollution control are among the problems which affect multiple jurisdictions and for which comprehensive planning is essential, not only by force of law but by reason of necessity.

There appears to be some correlation between the problems of land management and planning and population density. As population increases and urbanization spreads, management tends "to institute

the gains and economies which can be obtained from integrated planning . . . it encourages long term stability . . . lengthens long term production . . ." This tendency would aptly apply to the open space problem: as urbanization pressures develop there is greater need to designate lands for open space needs and accordingly develop planning to meet this need.

Aside from the pressures of urbanization, open space planning is significant in the preservation of aesthetic values and on the prevention or control of pollution. Where open space planning is done before development needs become critical, the task of management will be aided—once lands are lost or values diminished, the cost to correct mistakes multiplies manyfold in terms of time, money and effort.

Open space planning gains increasing significance in land management both in meeting pressures of urbanization and in making the best use of land as a resource and in the enhancement of environmental values.

REFLECTIONS IN THE LAW

There is mounting recognition of the need for comprehensive planning as a basis for governmental action, reflected increasingly in federal legislation. The requirement of such planning is incorporated in programs touching all fields; urban development, highways, outdoor recreation, health and other community facilities, and land problems. The requirement affects local government—municipalities and counties both—states and federal programs; it is especially pertinent in relation to open space planning and programs.

Comprehensive Planning Requirements in Some Laws

Typical of the comprehensive requirements in legislation as they affect open space provisions are those in housing, transportation and outdoor recreation. Most of these refer to the comprehensive aspects of certain functional areas, but legislation requiring conformance of projects and program to general comprehensive plans, particularly at the metropolitan area and regional level, are in the offing.

Department of Housing and Urban Development

The Housing Act of 1949, 1954 and subsequent years make specific reference to comprehensive planning requirements. In the urban renewal program it is required that a plan for a renewal project be found to conform to a "general plan for the locality as a whole." The Housing Act of 1954 as amended provides for specific financial aid for the preparation of comprehensive plans by localities, for metropolitan and regional areas and for the States.

The Housing Act of 1961, providing for the acquisition of open space, requires a comprehensive plan for urban parks and recreation for the "urban area" as a whole.

The 1965 Act providing for an Open Space Land Program requires a comprehensive metropolitan plan plus governmental agreement representing at least 60% of the geographical area.

Bureau of Public Roads

The highway program has for quite some time provided for an allocation of federal highway funds to be used for the comprehensive planning of areas. The Highway Act of 1962 provided that no federal highway funds were to be expended after July 1965 on highways when there are not comprehensive transportation plans for the area "which are formulated with due consideration to their probable effect on the future development of urban areas of more than 50,000 population."

Bureau of Outdoor Recreation

In 1963, the Bureau of Outdoor Recreation was formed in the Department of the Interior to formulate and maintain a nationwide outdoor recreation plan and to encourage interstate and regional cooperation in planning acquisition and development of outdoor recreation resources. The 1965 Land and Water Conservation Fund Act provides for assistance to states to plan for, as well as acquire and develop, lands and waters for outdoor recreation. Assistance to the states for outdoor recreation requires a statewide recreation plan.

Planning in BLM Legislation and Regulations

The legislation of 1964 affecting the public lands (P.L. 88-606, 88-607, 88-608) broadly implies the need for planning and makes specific planning re-

quirements under the regulations in the retention, management and disposal of the lands.

The Public Land Law Review Commission (P.L. 88-606) is to report on the coordination of laws pertaining to the public lands, out of which should come the broad legal basis for long-range planning in the future.

The Classification and Multiple Use Act of 1964 directs the Secretary of the Interior:

- (a) to determine which of the public lands shall be sold because they
 - 1. are required for the orderly growth and development of a community
 - 2. are chiefly valuable for residential, commercial, agricultural . . . industrial or public uses or development

which involves the public lands directly in urban and urban area planning; and:

- (b) to determine which lands shall be retained and managed—at least for the time being—for other purposes, including outdoor recreation, watershed protection, wilderness preservation—all of which are integrally involved with open space planning and in large-scale regional and state planning.

The Public Land Sale Act of 1964 (P.L. 88-608) also requires determination for sale (in tracts not exceeding 5,120 acres) of lands required for the orderly growth and development of a community—or which are chiefly valuable for residential, commercial, agricultural . . . industrial, or public uses or development.

Under the criteria for land classification, classification "must be consistent with state and local government programs, plans, zoning, and regulations applicable to the area . . ."

Under the regulations, additional criteria refer to planning; as for example,

"Lands determined to be needed for urban or suburban purposes may be classified for sale . . . if (i) adequate zoning regulations are in effect and (ii) adequate local governmental comprehensive plans have been adopted."

The regulations also state

"Sales of lands required for the orderly growth and development of a community will not be made unless adequate local governmental comprehensive plans have been adopted and adequate zoning regulations are in effect . . ."

and direction is given to encourage and assist

"State, County and local governments in master

planning and zoning. They will be encouraged to utilize the best modern techniques for quality land utilization, including preservation of natural beauty and of open space values."

Thus the public lands, their disposition and management, are directly involved in the planning of localities—whether of smaller communities or large metropolitan areas, whether of states or regions. By their nature, the public lands are crucial in open space planning whether of the urban or the rural or the far non-urban areas.

OPEN SPACE AND THE TOTAL ENVIRONMENT

There is developing a new concept of environmental planning wherein the problems of preservation, the prevention of pollution and a concern for aesthetics take rank with promotion, "progress", and exploitation.

It is no longer sufficient to solve problems of environment on a piecemeal basis, to deal only with separate functions separately. Much development has taken place, much land has been used or misused, without full concern for the effect on the total environment. Much open space has been taken over when better left as open space in relation to the over-all impact on the environment.

Notwithstanding the difficulties and complexities of dealing with the total environment, it is essential that consideration be given to the total effect of development and use in meeting localized and individual problems. In the case of land use and development, open space planning is an essential element in making this kind of consideration.

The Role of Open Space

The role of open space in the total environment is to provide a framework necessary for obtaining a balance between development and non-development. Its function is to supply the elements of land to be conserved, preserved and used in relation to development of all kinds. Open space is needed as breathing space, as space reserved for productive extraction, as space for recreation, greenery and the preservation of natural beauty and scenic values. It is needed to protect water supply, drainage; it is needed to provide the open ways to move about; it is needed as a reservoir of land as a resource.

... as a Functional Land Use

Because of the vast increase in population and the pressures of urbanization, land and space once considered more than ample, once considered to be without apparent functional use, must now be considered as a limited resource and as a primary functional use. Planning for use and growth must now be applied even in what were considered remote areas and the open spaces of the once remote areas are now to be included in planning and for planning.

The term "open space", while generally and freely used, needs to be refined, its several aspects described, and its definitions tested in application and practice. It is of especial importance that the concepts of open space be applied to planning for the use and

in arrangement of the public lands, for it is with these lands that there is the obligation to bring about more orderly development and a better total environment in the part of the country subject to increasing pressures of population growth and urbanization in the future, a future that is not distant because of the rate of growth and urban development.

The case for open space is becoming increasingly clear and it will be even more clear as open space planning is applied. A new statement is needed, not because there is not an awareness of open space but because open space must be established as a functional land use, not as an undesignated use to be taken over by any other use, and open space planning must be developed and used as a key means in all planning.

CONCEPTS OF OPEN SPACE

Open space is a positive and functional land use and it should be considered as a major element in the preparation of plans from small scale to large.

HOW IT ONCE SEEMED

The concepts of open space have come out of history in the expansion of the country, the nature of the society and the economy, and the play of forces on the land and its use. Land, it seemed, was plentiful in the wide open spaces, it was there for the taking, it could be exploited at will, it could be used or not used wastefully, it was subject to all kinds of claims, and eventually became something precious to preserve and conserve.

Land Aplenty and Free-For-All

The disposal of the public domain began even before the continental expanse of the country was completed. By and large, the larger policy problem up the last quarter of the 19th Century was how to encourage settlement of the continent, so as to undermine all claims by European powers. There was so much land available that it was difficult to achieve an agreement on the necessity for regular survey before disposal. There was so much land available that policies about its disposal were contradictory and chaotic. Sales were seriously undercut by donations and the allowance of warrants for military bounties. Land was given to underwrite all manner of development projects: railroads, canals, roads, schools. There was so much land that trespassers were not prosecuted and eventually the right of the squatter to buy his illegally occupied land was recognized. Ironi-



The recreational potential of open space is realized in the Red Cliffs area of Washington County.

cally, the ultimate legal development of free land, the Homestead Act, came finally at a time when limitations on the amount of land available began to be recognized.

Exploitation

Not only was it assumed that there was land in abundance for all, there was hardly any notice taken of the actual exploitation of land and its resources. The heavily forested Northwest Territory was stripped of its timber—often by burning—and turned into farmland. The land is extremely well-suited to farming, but the principle of cutting over all timbered lands was not restricted to rich farmland. It was more or less assumed that the entire interior of the continent was to be used for farms. The terrible devastation to the semi-arid lands of the Great Plains that became apparent in the 1930's was a result. The soil under the grass was moist—moisture accumulated over centuries. It would support crops for a while—perhaps 2, perhaps 10 years, depending upon precipitation. The fact of semi-aridity is that rainfall is undependable and once the cover is destroyed a drought period is ruinous. This type of soil cannot be farmed according to the methods used for moist farm lands and soils.

Exploitation was not limited to timber or the land itself. Its mineral resources were appropriated by any who could supply working capital. The early attempts to regulate the removal of valuable minerals—such as the Missouri lead deposits and salt deposits in the Northwest Territory—were not well conceived and ultimately failed. Thus, the amounts of gold taken from California after its discovery in 1849 not only were astronomical in value, no real compensation was made to the Federal Treasury.

The exploitation of water is also a saga of no policy, although there were rather more successful attempts to come to terms with the basic problems. Major John Powell made a very careful study of water resources in the Western states in the 1840's and recommended a system of regulation. This was largely ignored by all who could have effected a proper development (except by the Montana constitutional convention). Consequently the legal concepts governing water use in the West have been user-oriented. The man with access to the stream has the right to use the water as he pleases. He is under no obligation to be concerned about the quality of the water downstream.

Unused Land, the Left-Behind and Wasteland

Even today, much of the vast open lands of the West seem to be wasteland, unusable mountain range or desert flat. Expansion passed over or passed by. It took a later time to see some of these lands for their resources, even as places for settlement.

Checkerboard grants chopped up the potential for continuity in development leaving almost unplannable open spaces sandwiched and blocked between and among land to be developed for non-space purposes.

Urban growth early and now followed wasteful patterns, leaving "vacant lots, engulfed areas and surrounding tracts believed to be imminent for urban development." Premature subdivisions were left undeveloped, not much attention was given to open space relationship to densities, and greater amounts of land were taken for low-density development, more or less indiscriminately, leaving behind patches and parcels of land in the leap-frogging escaped from what was considered an inimicable urban environment. Suburb and strip cities spread rashly, "too often defilements of the natural scene, wasteful consumers of what might have been free space and green land."

A CHANGE IN VIEW

Conservation and other movements began to change profoundly the views of open space. There also emerged new views of open space use, especially in relation to recreation and new demands of burgeoning population. Together with a growing awareness that land is not unlimited, that vast new demands will be made on its resources in the future that planning must be involved in its use—all these have moved toward new understandings, definitions and concepts of open space.

Urban Demand

The demand for urban land will undoubtedly be felt to the greatest extent in the major metropolitan or urban regions of growth, but it will be felt full in areas heretofore viewed as non-urban—vast areas of undeveloped land, particularly in the West. The demands of urban land are already moving into the

hinterland, expanding existing communities; developing new towns; displacing farm, field and forest; filling in valleys and river basins; spreading over the countryside to provide the 2 million new homes a year needed, schools for 10 million additional children and transportation facilities for the daily movement of 200 million people and more than 80 million automobiles.

In the remainder of this century we will have to build in our cities as much as all that we have built since the beginning of the nation. City land will double and the need for open spaces as such to serve urban needs alone will increase accordingly to provide for recreation, water supply, flood protection and transportation space.

The concern for the amount of space centers not so much on total acreages but on the strategic location and the designation of the kinds of lands that may be subject to different kinds of uses. Demand for open space then will contend with demand for other uses and thus must be considered as a functional use in itself if it is to be made available at all. The demand for open space to serve specific needs in urbanization is changing the concept of open space as a standby for other uses to a concept of primary urban land use.

In a larger context, similar demand for specific use of open lands for recreation and other urban-oriented uses carries this concept of open space as a functional use to larger application. Whether in terms of a neighborhood or community park or a large regional recreation area of great size, open space is a specific, positive need and must be considered as a major claimant for land use at all levels and scales.

The Mess of Mistakes

Another change in the concept of open space has come simply as a reaction to the mistakes that have been made. As pressure from urbanization and other causes mounts, there develops a deeper sense of need, a more intense consciousness of self-preservation, a growing objection to misuse and waste. Some of this is reflected in Whyte's account of Santa Clara County:

"In 1945 it was a farm county, one of the richest in the nation, and in its fertile valley floor was 70 per cent of the Class I farm land in the whole Bay Area. From San Francisco some thirty miles north, only a few homeseekers had come down, and urban development was concentrated in a few compact communities, notably San Jose . . . by the end of 1956, developments were scattered all over it.

Thanks to county action, however, one big patch of green was saved. This is the Berryessa agricultural zone just north of San Jose . . . Farm groups feel that more than self-interest is involved. Their argument is that the future food supply of the country is jeopardized by sprawl. Of 465 million acres of cropland in the U.S., only 72 million are on Class I land—and over half of this highly fertile Class I land is in urban areas."¹

Underlying the desire to eliminate the roadside

auto graveyard, or the unhappily placed billboard, or to clear streams, or recover from floods is the profound feeling of protecting view and amenity, as well as property and life itself. The mistakes that have been made have been real enough, they have been brought home to people everywhere and they have made people feel that open space as such is a positive value not to be lessened or lost.

Putting It Into Words

The statements of changing concepts of open space are reflected in a growing literature on the subject. The nature and function of open space are being analyzed and defined. Charles Eliot makes a distinction between open space for *service* and open space for *structure*. Tunnard and Pushkarev spell out four functions served by open space: *productive, ornamental, protective, recreational*.

Stanley Tankel interprets open space in two ways: first the kind of open space of which people are personally aware:

" . . . it is *used*—for the wide range of active and passive recreation activities, for circulation; it is *viewed*—from the home, the road or other vantage points; and it is *felt*—it gives privacy, insulation or sense of spaciousness and scale . . . "

and second, the open space of which people may be

3. Open Space for Ecological Protection or for the Preservation of Certain Desirable Natural Characteristics
4. Open Space for Urban Structural and Aesthetic Purposes
5. Open Space Provisions for Future Urban Growth

Statement of the New Concept

"We must look at vacant land and open land as something more than a residual category in the land use survey, something that is amenable to classification in some detail and the subject of special attention in land use planning."²

Open space is land specifically designated for three major types of uses:

1. Utility Uses such as Water Supply, Drainage and Flood Control, Forestry, Farming,
2. "Green Space" Uses such as Parks and Recreation, Building Entourage, Greenbelts, Natural Site Preservation,
3. Corridor Uses such as Streets and Highways, including related parking and other Landing Places.

The chief characteristic of *open space* is that it is *land open to the sky*. This is the simplest and most suitable definition and serves as a test of its use.

What is important in this concept of open space is that land designated as open space has a functional use, and serves a vital purpose in land classification and in planning for the use of land.

In this concept, open space is not left-over land, nor "undeveloped and unused" land, or "vacant" land. Even if land is designated as a reserve for future development, it should be so classified by intent.

Under this concept of functional use, land to be used by streets is for a specific open space use, that of passage or movement. As such it becomes part of an open space system, which together with open spaces make up the structural framework of development. Open space can and does become a determinant of development and provides a basis for meaningful and effective planning.

OPEN SPACE AND OTHER USES

The traditional classification of urban land consisted until recently of three major uses: residential,

² Chapin, F. Stuart, Jr. *Urban Land Use Planning*. (University of Illinois Press, Urbana, 1965.) p. 300.

commercial and industrial. These three basic categories have been subdivided over the years to indicate different types of intensive use, or to reflect new types of uses developing within the category. Thus, residential uses began to be subdivided into single family, or multi-family residential, commercial into central business or retail, industrial into light and heavy industry.

As urban uses of land have become more complex and varied, more extensive and more detailed classification has been developed.

Other categories have been added such as transportation, institutional and public uses, which have included parks, public facilities, and as the urban area became more extensive, even included non-urban uses such as agriculture. The present charge for disposal of public lands now indicates classes of land which are "chiefly valuable for residential, commercial, agricultural, industrial, or public uses or development."

Rarely has there been a designation of open space uses as such. Parks were usually indicated on land use maps, but primarily as a part of community facilities. Much open area was simply left undesignated or "vacant" or undeveloped. Reservoirs or bodies of water might be shown on a land use map, but the water basins, creek ways, flood areas, special topographic features or even the transportation right-of-ways were not shown as functional open spaces.

It is the definition and designation of such land for open space purposes that must now be included in land use mapping and planning—and as the urban areas become more and more extensive in coverage and influence, it becomes more vital to identify and designate open space uses over large territory, so that all uses including the non-urban uses such as agriculture, are taken into account.

Open Space and a Comprehensive Land Use Approach

Open space is more than another category in the list of land uses. First of all, being tied to the physical characteristics of the land, it is pervasive in its presence. Second, it comprises the larger part of an area of concern—in its functional uses—utility spaces—green spaces—corridor spaces—it takes up 50 per cent or more of urbanized and urbanizing land. Both because of the physical characteristics and its predominate position in amount, it must be considered as the base of a comprehensive land use program in analysis and planning.

space, and corridor spaces to provide a basic control for the total pattern of development. In this sense, the open space system can be considered the fixed element of an area plan, with the areas between the free elements for building and development.

as the designation of natural sites in relation to other urban uses.

THE NATURE AND TYPES OF OPEN SPACE

Open space has been defined here as land left open to the sky, serving specific needs, and performing specific functions within a total land area at both small and large scale. In itself it is a major competitor of urban land use and a key determinant of urban growth and development. The functions have been termed utility, green space and corridor spaces as broad categories.

The Utility Spaces

These are the surface spaces—water or land which does certain work—such as the storage of water—whether surface impounded or underground; or provide drainage or flood control by absorbing and holding water or channeling its flow. These are also the surface spaces which contain the direct productive uses of land in forests and farm lands, ore deposits and fishing and wildlife. Included in these uses may be the land reserves for the conservation of resources as storage functions or the reserves of land for development as land banks.

The nature of the utility open spaces is in their use as a basic land resource.

The Green Spaces

These are the lands and areas and water surfaces used for "green" purposes—parks and recreation, greenbelts and greenways or bodies of water which define, limit or control development, natural scenic protection, and the spaces around and between buildings. They include a variety of space forms from regional parks to neighborhood parks, playgrounds and other local parks; landscaped areas for sites and designated areas for preservation of natural characteristics.

The nature of the green open spaces is in their use

The Corridor Spaces

These are the spaces, land and water, used for rights-of-way of movement, transportation.

The nature of the corridor open space is that of passageways—channels of circulation and the directly related landing places.

MULTIPLE USES OF OPEN SPACE

Within the broad categories of utility, green, and corridor open spaces are a multitude of open space forms from large land reserves, through regional parks, water reservoirs, natural life preserves, wetlands, deserts, river and creek ways, playgrounds, expressways and streets and plazas. These are all open spaces.

In the broader aspects even such areas as college and university campuses, cemeteries, zoos and airfields take on some of the characteristics and uses of elements in an open space system. As area forms, they have a general open space character and in the overall, they meet in whole or in large part the test of land to open sky.

In the planning of an open space system, they may well be included, either as primary or secondary open space elements.

In both the designation of existing areas and in planning for open space purposes, land may be subject to multiple uses.

Existing Multiple Uses

In determining and assigning land uses there are overlappings and differences in interpretations. For example, the definition of "commercial" use refers to the sale, exchange, or distribution of goods and services. A warehouse or truck terminal is involved in the distribution and sometimes in the sale or exchange of goods and would seem to fit the commercial use designation. Yet there are instances where under zoning and land use assignments, this kind of facility is restricted to industrial use districts, when industrial refers basically to the manufacture, processing, testing

of goods and materials. Or there are cases where institutional uses—schools sometimes—are not considered appropriate in residential areas even though they may include residential facilities.

There are, then, multiple use conditions that need to be taken into account in assigned uses of land, and there may need to be evaluation of the primary function, the compatibility with adjacent or neighboring uses, the intensity of use, or the matter of size in making decisions about the appropriate or best use of land.

The problems arise in open space determinations. Open spaces may most frequently be subject to multiple use—a water reservoir (utility open space) may also be a significant recreation facility (green open space). The primary function may be that of utility, to store water as a resource, but the resource by its nature is also useful and available for both water and shore-related recreation.

A corridor route for a major highway may similarly offer possibilities of green space uses in provision for green belt or greenway areas in development.

Open space is subject to multiple uses and the determination of existing open space use should be made with regard to existing and potential multiple use with regard to primary function, intensity of use, and the size of area under consideration.

Planning for Multiple Uses in Open Space

Increasingly the planning for the use of land will be directed to multiple uses: a given quantity of land and water resources must generally serve more than one purpose at the same time and land management will more and more seek multi-purpose uses as an objective of efficient resource management.

Some land, because of natural characteristics and national land policy, will be planned for single use open space purpose as in the case of unique natural landmarks or designated wilderness areas where the policy purpose is in essence “to leave the land be.” It also serves no sound purpose to force one kind of use upon another simply for the sake of multi-use objectives. The imposition of another open space use only because the land is open space does not always serve the public interest in the long run. The most frequent error in this direction is the imposition of a highway (corridor space) on a park (green space) simply because the park is already in open space use.

Caution should be thus exercised in a multi-use approach to avoid the danger of the encroachment process. This is especially true when building develop-

ment uses are introduced as incidental uses. The emphasis on multiple purpose planning for open spaces should be on the multi-use open spaces.

As a general rule, open space should be planned for multiple purpose uses within the open space categories. Where a predominant open space use is indicated, other open space uses may be planned not to override such predominant use, and when indicated, single use open space may be best in planning for the long range public interest.

THE OPEN SPACE CONCEPT IN PLANNING

Open Space—land left open to the sky—is a positive and functional land use that should so be designated and planned for, and coordinated with all other development uses in the use and management of land resources.

Open space has a unique function to perform in planning. It should be considered the “fixed” element in planning to which other uses are related. By working up and establishing a system of open spaces—for utility, green, and corridor space purposes—a structural framework or armature for a plan can be laid out to serve three major functions:

1. *The open space system provides for a logical determination of the best uses of land beginning with its natural characteristics, its function to hold and drain water, and its use as a primary resource.*
2. *The open space system provides the essential means for physical order and continuity in planning by providing an over-all physical control in the use of land.*
3. *The open space system establishes the best and most advantageous siting for building development to create, maintain, and increase site values.*

By designating first the open space framework, a comprehensive plan can be organized to give full play to building development, opening up the maximum opportunity for good building and development design, while at the same time providing for the practical requirements of location, drainage, utilities, circulation, and amenity.

This concept is applicable and has been put into practice at all scales, from residential subdivision, to large industrial complexes, to college campuses, to comprehensive city plans and in regional planning. In all cases, the first identification is the land which

is not to be built upon because of its natural features (woods, streams, steep grades) ; needs for servicing (roads, utilities) ; and its own resource potentials (production and other open space uses). The process is to relate building development to open space uses and requirements. Under this process, all elements in planning can be related to each other while preserving the integrity and amenity of the land.

The planning of open spaces and open space system is the first step in comprehensive planning. The planning for open space and an open space system, providing for specific open space uses, both single and multi-purpose, and including land reserves, will provide a base and control for planning and other uses. In the survey and analysis of existing conditions and in the planning for growth and development, the open space approach is the practical means for the efficient use of land resources and sound planning of their future use.

CLASSIFICATION OF OPEN SPACES

All lands having open space values may be classified according to the nature of the land and the type of open space use: utility spaces, green spaces, corridor spaces. The base of classification for planning is the functional land use of open space, a distinct use in itself and coordinate with other land uses of development.

CLASSIFICATION CODE AND CRITERIA

In any classification system for land uses, a code of classification can be established for open space uses to identify, particularize and assign the open space uses and functions of the land. The classification system given here is based primarily on the functional use of land for open space purposes. It can be applied to categorize the present uses of land for open space

purposes, or to assign land for open space purposes in planning an open space system within a comprehensive plan.

The Classification Code

Open space is classified here in three major types: I. Utility Open Spaces; II. Green Open Spaces; and III. Corridor Open Spaces.

Each of these major types is particularized further in a number of subdivisions according to functional uses, which in turn contain a number of specific use types and examples.

Thus the general group of I. Utility Open Spaces, is subdivided into:

- A. Resource Lands
- B. Urban Utility Spaces
- C. Flood Control and Drainage
- D. Reserves and Preserves



Elements of historical significance, such as Indian ruins in Washington County, have value in the open space framework.

The subdivision of Resource Lands in turn lists:

1. Forest and Grazing Lands
2. Mining Lands
3. Agricultural Lands
4. Lakes and Rivers for Water Storage and Supply

The classification listing here is comprehensive in character, rather than exhaustive in detail. Within the major groups, subdivisions and sub-items, there can be coded generally all open space uses of land and where necessary still further special examples can be located or placed under the code.

Much land designated for open space purposes will be subject to more than a single use and therefore may be designated IV. Multi-Use Classification, as a major code use area. The subdivisions and sub-items under mulit-use classification will be identified according to the designations listed under the other major groups.

Under the multi-use classification may be listed also open spaces used directly in connection with other development but which may be significant in the planning of a comprehensive open space system. For example, a college or university campus, while planned primarily as a building development facility, may contain open space elements or characteristics—athletic fields, etc. so that the campus as a whole can become part of the over-all open space system.

Criteria for Classification

The classifications made here reflect as far as possible the classifications and definitions developed by other agencies such as the Bureau of Outdoor Recreation and State programs involving open space planning and programs. The general criteria to be applied in making classification of land for open space designation include both measurable data and value judgements.

1. *Primary functional use.* Open space should be classified primarily according to its functional use for open space purposes, including both its function as a distinct land use in itself and its relation to other uses.
2. *Relation to development values.* Whether open space values are greater than potential development values and should accordingly be protected against such development, and the degree of protection to be afforded, will be value judgements in classification.
3. *Size of land.* The classification of open spaces can apply to all sizes of open space lands: site, city areas, urban metropolitan areas, regions.
4. *Urban-rural considerations.* Classification can apply to both rural and urban areas, in urban-

impacted areas, the urbanized region and the "remote" region.

5. *Intensity of use.* Classification may take into account intensity, frequency or period of use, and these characteristics may be used in making detailed classification within the general code.
6. *Land characteristics.* Classification may take into account such land characteristics as vegetation, soil conditions, geological formation, and previous use treatments.
7. *Other conditions.* Classification may take into account accessibility, ownership (where non-BLM land as well as BLM land may be considered in relation to a comprehensive open space system), activity, historic and other cultural significance and problems of management. These may be considerd as modifying aspects or refinements in relation to the primary or general open space functions.

OPEN SPACE CLASSIFICATION

I—*Utility Open Spaces*

- A. Resource Lands
- B. Urban Utility Spaces
- C. Flood Control and Drainage
- D. Reserves and Preserves

II—*Green Open Spaces*

- A. Wilderness Areas
- B. Protected Areas
- C. Natural Park Areas
- D. Urban Park Areas
- E. Recreational Areas
- F. Urban Development Open Spaces

III. *Corridor Open Spaces*

- A. Rights-of-Way
- B. Landing Spaces

IV—*Multi-Use Classification*

- A. Competitive Uses
- B. Complementary Uses
- C. Mixed-use Development and Open Space

I—*Utility Open Spaces*

This category is based primarily on the productive capacity of land and on its utilization for productive and storage uses.

- A. *Resource Lands*: Land and water used for production or extraction of materials.
 - 1. Forest lands
 - 2. Grazing lands
 - 3. Mining lands
 - 4. Agricultural lands
 - 5. Lakes and rivers for water storage and supply
- B. *Flood Control and Drainage*: Lands properly unavailable for building unless unusual protective measures are taken; used to protect rural and urban lands alike.
 - 1. Flood Plains and Flood Banks
 - 2. Watersheds and watershed protection areas
 - 3. Drainage ways: Streams, Ditches, Creeks, or other Paths for normal run-off water
 - 4. Erosion Control Areas
- C. *Urban Utility Space*: Land areas set aside and used for direct urban needs.
 - 1. Dam sites and reservoirs
 - 2. Land Fills and Waste Disposal areas
 - 3. Sewage Treatment Facilities
 - 4. Borrow Pits
- D. *Reserves and Preserves*: Land and water areas set aside and protected for future resource uses.
 - 1. Forests not managed for timber or recreation
 - 2. Areas for Wildlife Refuge, Breeding, Sanctuary
 - 3. Lands reserved for Urban Development
- E. *Wildlife Refuges Open to the Public* (Example: Arkansas Wild Life Refuge)
 - 1. Scenic Areas, including National Parks and Forests (Example: Bristlecone Pine Area)
 - 2. Areas of Cultural or Historical Interest or Value (Example: Mt. Rushmore National Monument)
 - 3. Coastline and Shore Areas to be Protected from Urban Encroachment (Example: Monterey County, California)
- F. *Natural Park Areas*: Areas designated available to the public but maintained in as natural state as possible: often identified by the presence of some natural element unique to the area.
 - 1. National Parks and Forests
 - 2. State Parks
 - 3. Natural Environmental Areas: limited or no man-made facilities
 - 4. Regional Parks: large-scale parks more directly related to urban regional development, ski areas
- G. *Urban Park Areas*: Parks more intimately related to local urban metropolitan development as to origin of users as well as to location.
 - 1. Zoos
 - 2. Botanical gardens, arboretum, wooded areas
 - 3. Nature trails, riding areas
 - 4. Special open-air facilities: fairgrounds, arenas, amphitheaters, outdoor cultural facilities.
 - 5. Boating, other water facilities
- H. *Recreation Areas*: Open spaces developed and assigned for more or less organized outdoor recreational facilities.
 - 1. Recreation Lands: A BLM designation. A tract of land usually several thousand acres in size where recreation is the dominant and primary use. Recreation use may be concentrated in recreation sites or dispersed. Recreation Lands are selected on the basis of unique scenery, geologic, or natural features.
 - 2.

II—Green Open Spaces

This category is based on open spaces where the natural site or condition lends itself most advantageously to use for recreation, parks, building sites, non-extractive uses, and to shape urban development. The use may be limited or intensive, active or passive, large or small.

- A. *Primitive or Wilderness Area*: Areas to be left in maximum natural state for scenic, geological and ecological values, for the preservation of vegetation and animal life in the natural state. Minimal access; service developed restricted to periphery; no other specific activity for the land.
 - 1. Wilderness Areas designated by Congress, State or other governmental agencies
 - 2. Other Unique Natural Areas
- B. *Protected Areas*: Limited access and controlled development required for the protection of special areas of scenic and other natural values.

pools, ice rinks, tennis courts, picnic areas, riding and hiking trails, etc.

F. Urban Development Open Spaces: Open spaces which shape, control and site urban development.

1. Planned greenbelts and green-wedges
2. Greenways, buffers, separators: creek and other stream routes developed as urban greenways
3. Plazas, malls, concourses, commons, squares
4. Building entourage, setbacks and open spaces around buildings for plantings, etc.

III—Corridor Open Spaces

This category includes the open space assigned to the paths and areas of movement or passage. They take into account not only the lines of circulation but also the landing, stopping or interchange spaces which are integrally part of a circulation system.

A. Rights-of Way Spaces: Lands specifically designated for specific circulation use.

1. Highways, streets, alleys, drives.
2. Rivers, canals.
3. Railroad, and other rail rapid transit lanes.
4. Utility rights-of-way easements: pipe lines, power lines, irrigation systems.
5. Air lanes designated through zoning and other regulations.

B. Landing Spaces: Lands specifically designated for terminal and interchange uses.

1. Parking areas.
2. Airfields, marshalling yards, docks, truck terminal facilities.
3. Interchange areas; cloverleafs, transfer areas, etc.

C. Scenic and Environmental Corridors: Lands designated as part of an open space system to preserve scenic views and total environmental character, particularly in connection with highway and other circulation networks.

IV—Multi-Use Classification

A large proportion of open spaces are devoted to more than single uses. A dominant use, such as a water supply reservoir, may control classification assignment (in this case under Utility Open Space) even if other uses may be present, such as allowance for hikers and picnickers and other recreation (Green

Space Uses) for the reservoir area. Because of the emphasis on the multi-purpose use of land, the Multi-Use Classification is of great value in the development of an open space system in comprehensive planning.

A. Multi-Use May be Competitive

1. Forestry or water supply vs. recreation.
2. Wildlife conservation vs. recreation.
3. Highway corridors vs. park and other open spaces.

B. Multi-Use May be Complementary

1. Multi-use for timber, grazing, summer residence, and recreation (Boise District, BLM).
2. Recreation in flood basins and watershed conservation areas.
3. Transportation corridors and green spaces.
4. Hiking Trails along power or pipeline rights-of-way.
5. Bicycle paths along watercourses.
6. Recreation in buffer areas.
7. Recreation and natural conservation.
8. Water supply and recreation.

C. Multi-Use and Mixture of Uses

1. Mixture of open space and development: College and other institutional campuses with open space provision and character that can be located in greenbelts and other urban open spaces.
2. Spaces which are not fully accessible to the general public but which are available to a significant portion of the population and could be included in an open system such as private clubs with recreational facilities, commercial amusement and recreation areas, institutional, recreational and garden areas.
3. Other uses which meet the open space definition but have special uses, such as cemeteries, which can be included in an open space system.
4. Compensatory open space as development: open space in relation to density of development such as that which may be "visually borrowed" from adjoining development, or which compensates for lack of space within a development. Compensatory open space comes into play especially in relating building height to land coverage, in greater intensity of building development compensated by additional common open space as in cluster and other planned unit developments.

SYSTEMS OF OPEN SPACE

Open space elements by themselves have distinct functions to perform, but it is in a system of open spaces that the structural framework for urban development can be established. A system of open space is created by the fitting together of open spaces in a continuous connected series of open space elements, or in a series of elements disposed in a functional pattern. The characteristic of a system is that each element has a positive relation to the others, and the whole has a form in which each element has a meaningful and functional place.

Single Use Systems

A single use system is based on one type of physical or natural feature, such as stream valley, or on one type of open space development, such as parks.³ A corridor system made up of streets and highways is a typical urban open space system. A similar system may be developed in a pattern of streets and squares or plazas, where the square serves essentially as the landing, collecting or exchange element in the circulation system.

1. A stream valley system is exemplified by that developed at Toronto, Canada, basically a corridor system with some lakefront areas. There a basic single use system is proposed to be expanded into a multi-use system to include water supply, conservation and flood control.

2. Metropolitan Washington is also a basic corridor system using stream valleys and parkway corridors. This is in turn related to the system of urban open spaces in the malls and entourage of large institutional uses.

3. The "Emerald Necklace" greenbelt of Cleveland, Ohio, consists of a continuous park road string joining "beads" of regional reservations, some left in a natural state and some developed for organized recreational uses. The greenbelt system can be found in the Greenbelt communities—Greenbelt, Maryland, Greendale, Wisconsin, and in the regional and new town planning in England

4. A classic example of a green open space system is Olmstead's system in Boston, Mass., linking park, pond, passageway, and preserve in a varied and vital system.

Multi-Use Systems

Most open systems will be multi-use systems in which utility, green and corridor spaces are combined in a continuous network of open space—building entourage, to streets, to plazas, to parks, to recreational areas, to reservoirs, to flood basins, watersheds, waterways, etc.

In a multi-use system, many of the open elements will in themselves be multi-use open spaces. In large regional systems, this will be characteristic. In new town planning, an open space system can be developed as the condition and control of development. In large regional areas, the establishment of an open space system can provide control for urbanization.

1. The Greater Boston open space system is a combination of valleys, park roads and parks and a proposed "green zone." Included are reservoirs and parkways as well as development of river and stream corridors and specific park uses.

2. Regional open space systems can be found in river valley systems, at present too often marked out in separate purpose planning and development. State systems as well need to be developed, combining single program planning such as recreation, water supply, highways, and river development. These need to be integrated into a complete open space multi-use system.

Functional Characteristics of Systems

The open space system as a structural framework for comprehensive planning and development has a number of design characteristics which identify, establish and organize the system.

A. *Edge:* The edge is the area or line that gives definition to an open space. It is the area where "systems of energy" come together as where water and land meet, or where open space and building development join. The essential function of the edge is to give definition, to establish boundary and form and to join uses. The edge may be the most sensitive part of open space and requires careful treatment. The edge as border is both separator and unifier of open space and development lands. Open space systems may in themselves serve the function of edges in large scale comprehensive planning, for separating various kinds of development, for defining large elements of urban development and giving them form.

B. *Linkage:* The linkage is the open space area that connects the elements of an open space system to provide continuity. A characteristic linkage is that of the corridor space such as a street or highway which connects and gives access to green and utility open spaces. The linkage may

³ This is one of the classifications suggested in Tunnard's and Pushkarev's *Man-Made America: Chaos or Control*, Yale University Press, 1968, Part V, Section III, "The Framework of Open Space Design."

be a plaza or other focal point or area which fixes, locates or joins the elements of the open space system. At the regional scale or in the large urban area, waterways and major routes may become the chief kinds of open space linkages.

C. Penetrants: The penetrant is the open space area that serves as a break into development such as green wedges and open space areas extending from a linear system. The penetrant serves as a true "breathing space" in urban development, and also helps provide a balancing element of natural landscape with manmade environment. The penetrant can also introduce variety and contrast in development of higher densities.

D. Focus: In an open space system, a focus is a place or landmark to give orientation and to organize the sense of direction and distance. In the urban context, this may be a plaza, a square, a monument, the widened area in front of an important building. In the open country, the focus may be a landmark, a special geological feature, a land formation, or even some manmade object. In the forest it may be a clearing, in the desert an oasis.

E. Continuity: The fundamental character of a system is that of continuity, with connection and flow elements in series. Natural features such as a river may perform this function. A series of parkways or of connected plazas may provide continuity. One kind of element may merge or connect with another to form a continuous series of open space elements as in the case of the Olmstead open space plan for Boston.

An open space system itself may serve the function of continuity in the urban area, providing the skeletal form, hinging together what otherwise may be disconnected and unrelated development areas. In this sense, the continuity of an open space system can provide a sense of identity and the identification of the urban form.

SIZE, INTENSITY OF USE, AND TIME OF DEVELOPMENT

The classification of open spaces catalogues open space lands according to their primary uses, which apply in all sizes of areas, for varying intensities of use, and over periods of time in development. These modifying characteristics, however, are helpful in planning open space systems.

Size

Within each category of open space, or within each open space system, is a range of sizes: open green

spaces range from the intimate family yard or patio (that may be significant in site and subdivision open space planning) to the large scale metropolitan or regional park (that may become key elements in a regional open space plan). The residential street is an open space element significant as a corridor space in subdivision planning, and this corridor element links with others through a range of arterials, parkways, boulevards, freeways on to the national inter-city system that may be a significant element in large regional programs.

The range of size is a factor in the planning of an open space system. Even small areas may have a key role to play in the development of a system to serve as linkage or focus, to complete continuity and to meet needs of intimate scale. The range of size will also be a factor in creating variety and contrast in the design of the visual environment and in adjusting view and sense of space in relation to speed of movement.

The problem of size can be readily grasped in the urban situation, where familiar street, small park, and building have built up common experience. The regional scale is perhaps less easily grasped, but access and air views are of great help which these are needed especially in making determination of smaller scale problems within the larger scale area. As command of information, and the need for working in terms of large scale regions, networks and systems develop, planners may have to consider open space development on a continental scale, such as the consideration of the Appalachian Mountain Chain from Canada to Tennessee as a continuous national preserve which would visually define the Atlantic Urban Region.⁴

The work at a continental scale would appear to be significant in the Western States. Such thinking is already in order, as in the case of a continental scale of planning for water. (See Figure 1)

Intensity of Use

In an open space system, there are different levels or intensities of use. What may be considered sterilized land or unusable land may in fact be simply land of very low intensity of use. The open space system may include such lands as wilderness and untroubled areas, even at a small scale and at close-in locations. This may become particularly pertinent in flood con-

⁴ Ibid, p. 444.

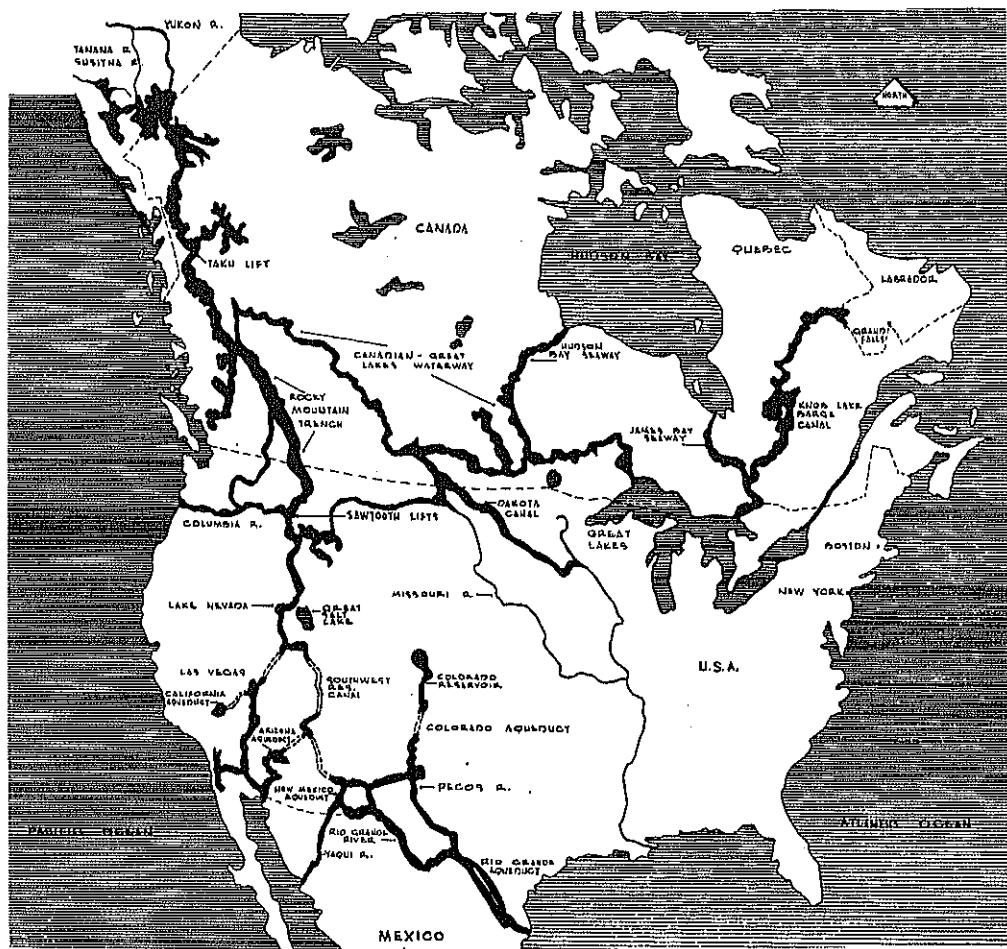


FIGURE 1—Continental Scale Water Resource Plan⁶

tral problems within heavily built-up areas. There are situations where the untroubled space is much needed as a storm sewer, concrete paving or other

flood control structure. In areas not yet fully urbanized, the opportunity to plan for these open areas of low use intensity prior to development is especially great.

Very intensive use by a dominant activity may exclude other possible uses. A busy highway at rush hour is the most intensive use of an open space and may exclude any other consideration. Scenic highways should be planned where they can best serve this multiple purpose of highway use and view. Urban expressways through urban parks are not equivalent to scenic highways when they are in fact city thoroughfares carrying heavy loads of traffic through park areas of relatively much lower levels of use intensity.

Frequency or period of use is another characteristic. While a ski area may be intensively used during the snow season, it is also available for a different use during the warmer times of the year. A rail right-of-

⁶ Excerpted from *San Francisco Sunday Chronicle*, March 21, 1966, Second Section, p. 6. In answer to the already-inadequate water supply in the Western United States, planners are at work on this huge integrated system which is destined to end the critical water shortage, restore the Great Lakes to their normal level, and furnish 70 million kilowatts of new power. A vast complex of waterways, including a 2,000 mile seaway, it would be history's biggest public works program. Called the North America Water and Power Alliance (NAWAPA), the plan has implications beyond water and power. Accelerated economic growth for the three countries involved, increased land values, and new recreational facilities are seen as principal adjuncts to the plan. The system would originate in Alaska, stored water would then be channeled through a complex of canals, tunnels, lakes, dams and reservoirs through British Columbia where additional water resources would be gathered. A 500 mile trench through the Rocky Mountains would extend the system into Montana, and an offshoot in Canada would feed the upper Mississippi and Missouri basins. Another offshoot would feed to the Great Lakes. South from the Rocky Mountain trench, additional canals and waterways would bring water to most of the West and to the northernmost states of Mexico. This is a bold \$100 billion plan to divert excess waters from the northwest to thirsty areas of Canada, the United States and Mexico.

way is intensively used at intervals only. Depending on noise and other controls it could double as a green buffer or visual relief in a crowded urban area. New rapid transit planning may be confronted with this particular problem in urban metropolitan and regional planning.

In some classifications it might be helpful to consider and note qualities relating to permanence of use. Sanitary land fills, for example, are temporary or transitional utility uses, but might eventually be permanent open green spaces or transferred altogether out of the open space category. Since the nature of any comprehensive plan involves continuing process and change, the changing nature of some open space uses may be of some importance.

Timing of Development

Timing is a function of planning. In the planning of an open space system, not all the elements may be available for development at the same time. The task of program scheduling becomes important, particularly in implementation of the plan.

This task is present in areas still not greatly developed. An additional problem is in the preservation and control of open space. The surest way to preserve open space is to own it, designate and plan its use, whether the party is a subdivision developer, a city, a state, a regional authority or other governmental agency. The designation and planning of its use applies where there is less than outright ownership, where, for example, a scenic easement would be called for in an open space plan or general comprehensive plan for the area.

In the undeveloped areas, an open space plan may best project open space needs beyond foreseeable needs for developable land. Projections can be made for the long future at the larger scale of planning and can be sensibly translated into more immediate needs of smaller areas. What is of key importance is that the elements of a system be programmed as a basic part of the open space plan, so that the timing of acquisition, disposal and development, are specifically provided for.

Timing involves questions of priority and implementation, and these are significant in the preparation and effectuation of plans for open space systems.

OPEN SPACE IN OTHER CLASSIFICATIONS: EXAMPLES

Some open space uses appear in other classification systems. They are usually either grouped under other headings such as public uses, or they are simply lumped under a catchall labeled "unused" or "undeveloped" land. And, of course, transportation rights-of-way are in separate categories.

These are inadequate for conveying the total open space concept and for preparing an open space plan. Several of these classification systems are included as illustrations and may be useful to open space planning in some circumstances.

The HHFA-BPR Standard Land Use Code

There has long been an interest in establishing a standard classification system for land use. The Bureau of the Budget developed the Standard Industrial Classification (SIC) system to assist in standardizing data collection from all Federal agencies. This is a specialized system dealing only with industries.

Later, the Bureau of Public Roads (BPR) and the Urban Renewal Administration, then part of the former Housing and Home Finance Agency (HHFA) and subsequently made part of the new Department of Housing and Urban Development, collaborated in establishing a standard land use classification and coding system because of the need to collect land use information that would be equally useful to urban development planning and transportation planning programs. The two agencies needed to be able to compare data at many levels—regions, States, localities—and also to study trends in specific and individual urban areas.

They began a joint investigation in 1962 mainly to see whether or not such a "uniform and universally applicable land use classification and coding system was feasible."⁶ Over 50 different systems were reviewed. The system adopted made distinctions among:

A. *Parcel Characteristics*: Location, ownership, soil type, land value, zoning, etc.

⁶ *Standard Land Use Coding Manual: A Standard System for Identifying and Coding Land Use Activities*, (United States Government, Urban Renewal Administration, Housing and Home Finance Agency, and Bureau of Public Roads: Jan. 1963) p. 8.

B. *Structure Characteristics*: Type of structure, total floor area, height, condition, etc.
C. *Land And Space Use Characteristics*: Residential, nuisance value, number of residents, etc.

The "activity" categories of the last group are the most extensive in nature and varied in type. A major objective of the study was to identify each land use activity so that it could be used in an automatic data processing system. It was concluded that no one rigid system was possible because of the variance among cities and purposes. But an approach that would permit "standardization in coding land use activity data, and flexibility in the use of data once it is coded" was seen to be possible. The system worked out was a multi-digit system where the first digit in any specific classification represents the generalized activity category as follows:

1. Residential
- 2-3. Manufacturing
4. Transportation, Communications, Utilities
5. Trade
6. Services
7. Cultural, Entertainment, and Recreational
8. Resource, Production and Extraction
9. Undeveloped Land and Water Areas

There are two-, three-, and four-digit codes in this system which permit a wide range in amount of detail desired. To be used with the standard system there is also a series of auxiliary codes, which can be used to describe other than major uses. There are 7 specified auxiliary codes. Codes 8 and 9 are left open to designations to be assigned by the agency making the land use activity survey. The manual suggests, however, that the auxiliary codes may not be sufficient for special recreation or open space studies and that perhaps a separate set of auxiliary codes should be developed for these leaving the standard auxiliary codes intact for broad application.⁷ Thus, it would be possible to fit categories of open space uses into the HHFA-BPR code, and in fact, may under certain circumstances be exactly proper.

Chapin has made suggestions about a more sophisticated kind of grouping based on activity and space needs rather than on the traditional ground floor use categories. These are only slightly revised over the HHFA-BPR categories, however. Where HHFA-BPR calls category 9 "undeveloped land and water" Chapin labels it "no activity." He does suggest that "no-activity" land should be evaluated and coded according to whether or not it is improved with util-

ties and whether or not it is available. Open space is relegated to a subsidiary position in this system as well as in the HHFA-BPR system, and unbuilt-on space is clearly regarded as "unused" space. Open space is thus not substantially clarified as a major positive land use in these classifications systems.

The BOR Categories

Section 5 of the Land and Water Conservation Fund Act of 1965 contains the authority and the relevant requirements and conditions for providing assistance to the states for planning, acquisition, or development of recreation resources. A comprehensive state-wide outdoor recreation plan is required. Chapter 4 of the BOR Grants-In-Aid Manual lists the specific requirements for the content of such a comprehensive plan which include, among other things, requirements for coordination with HHFA and highway planning. A classification system is presented by which recreation resources are to be inventoried and evaluated with the following categories:

CLASS I

HIGH DENSITY RECREATION AREAS—Intensive recreational use and development, usually within or near major centers of population but may occur in areas which are remote; subject to intensive use in peak loads and require great initial investment in facilities.

Examples:

1. Jones Beach, N.Y.
2. Huntington Beach State Park, Calif.
3. Colter Bay Recreation Center in Grand Teton National Park, Wyo.

CLASS II

GENERAL OUTDOOR RECREATION AREAS
Relatively accessible to urban centers; extensive peak load use but less elaborate or complete facilities than Class I, although most types of activities are accommodated.

Examples:

1. Rock Creek Park, Washington, D.C.
2. Golden Gate Park, San Francisco, California
3. Kensington Park, Huron-Clinton Authority, Michigan

CLASS III

NATURAL ENVIRONMENT AREAS—More remote from population centers than Classes I or II; occur through the country—the largest

⁷ *Ibid.*, p. 12.

(A parking ratio is the amount of square feet of parking space for every square foot of ground area covered by store buildings.)

class in both public and private ownership; weekend and vacation type uses; generally less range of facilities with a greater feeling of natural environment; may support other uses such as timbering, grazing, watershed protection, etc.
Examples:

Cutover areas in northern Lake States; public lands of this category often adjoin Class IV and Class V areas in national and State parks and forests.

CLASS IV

OUTSTANDING NATURAL AREAS—Individual areas of remarkable natural wonder, high scenic splendor, or features of scientific importance; facilities are minimum required for public enjoyment and appreciation of the natural features.

CLASS V

PRIMITIVE AREAS—Lands already designated under the Wilderness Act and other lands having similar characteristics of extensive natural, wild and undeveloped areas removed from the effects of civilization, undisturbed by commercial utilization, and without mechanized transportation.
Examples: (Already designated)

1. White Mountain National Forest, New Hampshire

Undesignated:

1. Sawtooth Primitive Area, Idaho
2. Anza Borrego Desert State Park, California

CLASS VI

HISTORIC AND CULTURAL SITES—Sites associated with the history, tradition, or cultural heritage of national, state or local interest and of a significance to merit preservation or restoration; development sufficient to accommodate visitors but limited to prevent overuse.
Examples:

1. Mount Vernon
2. The Civil War Battlefields
3. Mesa Verde National Park Indian Dwellings

This system was developed for the purpose of classifying lands for recreation use and does not include all open space considerations. It, therefore, is not completely adequate for classifying lands for comprehensive open space planning.

State of Wisconsin, Department of Resource Development

The major emphasis in the program developed by the Department of Resource Development in the

State of Wisconsin is on a comprehensive recreation resources inventory and program for developing potential parks, recreation and wildlife areas and open spaces. Resources are classified according to their recreation potential, and recreation facility or space needs according to *activity*. The State Planning Department has developed the following classification system for land use in the State:

URBAN USE

Residential: Urban Core, Medial Ring, Urban Fringe.

Non-Residential: Industrial, Commercial, Institutional, Transportation, Tourist.

RURAL USE

Agricultural: Cultivated Land, Uncultivated Land.

Non-Agricultural: Residential, Industrial, Commercial, Institutional, Transportation, Tourist.

RESOURCE USE

Forestry: Commercial, Non-Commercial.

Mineral:

Water: Lakes, Reservoirs or Flowages, Streams.

PUBLIC AND PRIVATE OPEN SPACES

Parks and Recreational Areas:

Conservation Areas: Wetlands, Wildlife Refuges, Public Hunting and Fishing Grounds.

Reservations: Military, Public, Private.

UNUSABLE

Swamps or Wetlands not otherwise classified, Rock Outcrops, Sand Plains, Scrub Forests.

The Department of Resource Development, in evaluating potential recreation sites covers the following points:

- Land Use
- Key Natural Attraction
- Type of Cover
- General Soil Type
- Access
- Number of Acres
- Water Use
- Beach Development
- Other Development
- Scientific and Geological Significance
- Historical and Archeological Significance
- Other Cultural Significance
- Recommended Use by State, County, Municipality

No urban-scale open space evaluation is made in this classification system on the assumption that this lies outside the jurisdiction of the State Agency and will be covered by each municipality.

Santa Clara County, California

The classification system for the General Plan for Santa Clara County, California, has four major divisions. Two of these are open space categories, although only one is so labeled:

- A. *Open Space*: Watershed, Agricultural, Public Facilities-Parks, Civic Centers, Schools, etc.
- B. *Employment Areas*: Industry, Industrial Park, Industrial Reserve, Commerce.
- C. *Residential Areas*: Low, Medium Low, Medium, Medium High, High.
- D. *Circulation*: Freeways, Expressways, Thoroughfare, Recreation Roads, Parkways, Rapid Transit.

Santa Clara County has a well-known interest in preserving its agricultural lands and open spaces, which may not seem pertinent in other locations. Granted this bias, the four classifications for land use are greatly significant in relation to the establishment of planning goals.

Baltimore Regional Planning Council

The comprehensive land use plan for the Baltimore Region seeks to shape growth according to a pattern where open space is used in "separator strips" as a design element. These strips are distinguished according to scale and are assumed to contain specific uses.⁸

⁸ *Technical Bulletin No. 2, Baltimore Regional Planning Council 1958* pp. 10, 11.

COMMUNITY SPACE SEPARATOR STRIPS

Municipal Parks, Cemeteries, Country Clubs, Golf Courses, Sports Clubs, etc., Small Scale Agricultural Uses, Radio Towers, Sanitariums, Homes, etc., Religious Orders, Private Schools, Fraternal Organizations, Boulevards and Major Streets.

TOWN SPACE SEPARATOR STRIPS

$\frac{3}{4}$ TO $\frac{1}{2}$ MILE WIDE

Heliports, Air Strips, Municipal Parks, Quarries, Industrial Park Developments, Junior Colleges, Hospitals, Cemeteries, Country Clubs, Golf Courses, Sports Clubs, Small Scale Agricultural Uses, Radio Towers, Sanitariums, Homes, etc., Private Schools, Farmettes, Large Lot Residences, Religious Orders, Sanitary Fills, Expressways, Storm Drainage Storage Ponds, U. S. Government Reservations.

METROPOLITAN GREEN STRIPS

$\frac{3}{4}$ TO $1\frac{1}{2}$ MILE WIDE

Estate Areas, Conservation Areas, Reservoirs and Watershed Areas, Wilderness and Wildlife Areas, Special Large Agricultural Areas, Major Military Installations and Airports, Parks, Major River Valleys for Flood Control, Soil Erosion, Etc., Special Private Schools - 100 Acres Minimum, Homes For The Aged if tied with agriculture, Large Cemeteries, Sanitariums, Correctional Institutions, Religious Orders (including Summer Camp Retreats), Reforestation Projects, Airports - Civil Colleges and Universities.

GUIDES AND STANDARDS FOR OPEN SPACE PLANNING

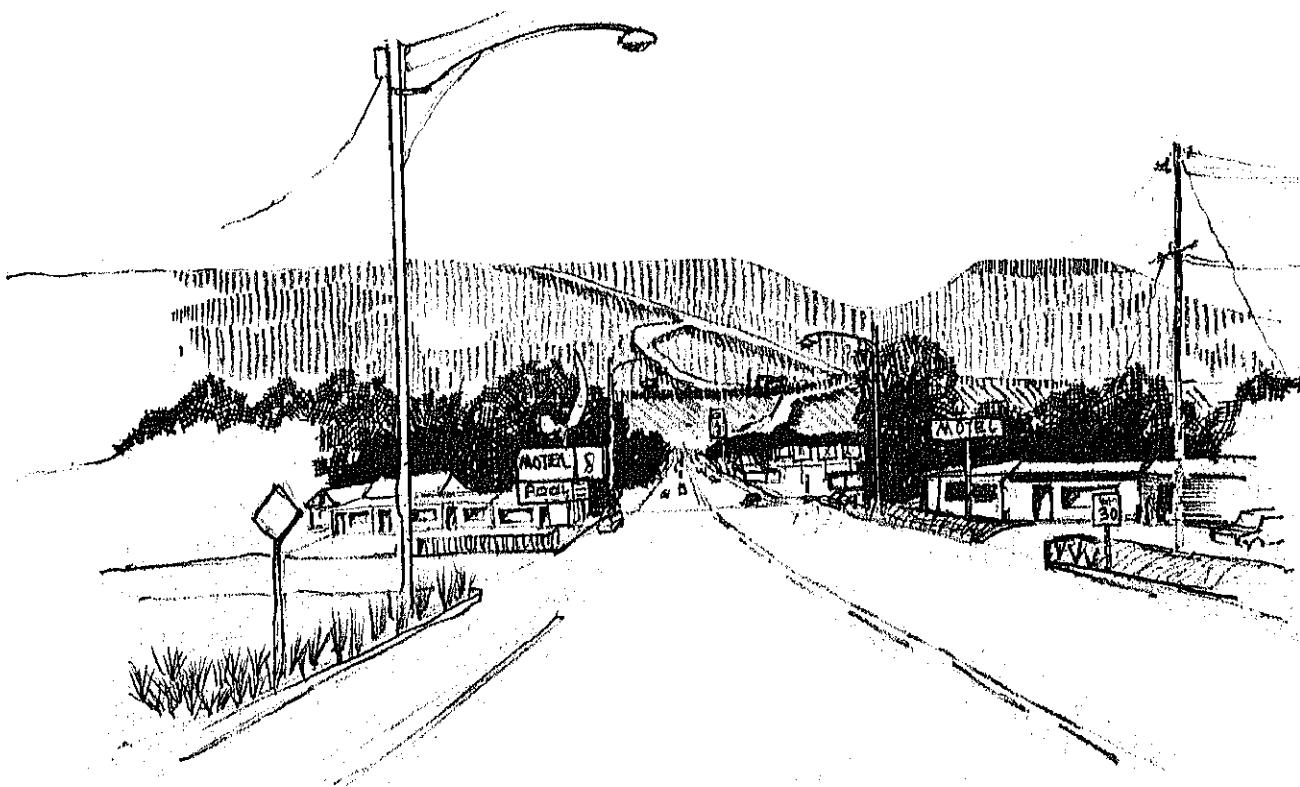
Guides and standards are indicator tools in planning, not rigid formulas to be applied without regard to specific local conditions and the judgement of purpose and experience.

Open space planning, as in other elements of planning, is concerned with location and amount. As part of over-all comprehensive planning it is also concerned with relationships to other uses, as worked out in land use patterns and arrangements of uses.

It would be a simple matter to plan for open space as to its location and as to the amount designated

for any and all open space uses, if location were not variable because of topography and other natural conditions, and if amount were not variable with the changing needs of people. It is therefore difficult, if not impossible, to state arbitrary formulas that will satisfy all conditions. Judgement must be applied along with knowledge and experience.

There are, however, guides and standards, growing out of knowledge and experience, to assist the exercise of judgement. Some number of standards have been evolved or proposed as a base of planning



The image of a city may be affected through thoughtless use of natural landmarks such as the surrounding bluffs of St. George, Utah.

but even these are limited and if rigidly applied, limiting. Even more important, perhaps, are the guides that may give direction and reference to professional and field personnel who face immediate and practical problems in open space and open space planning. While the guides and standards may include mathematical measurements, their prime use and purpose is to give a base of reference from which plans, and decisions in the field, may develop.

TRENDS

The techniques of land use planning which have been developed in this century here and abroad have been basically in three areas, or phases, in the planning process. First is the statement of objectives which the land use plan is to embody. This is often called the *qualitative* aspect of the plan. The second phase in the planning process is the *quantitative* one—a process which assess existing amounts of land or space for various uses, evaluates future needs, and seeks to bring the two into balance with available resources. The third and final phase is the design of the plan itself which seeks to bring the first two phases together and prepare a sketch or series of proposals.

There is a marked trend toward systematizing the processes of planning, particularly in the quantitative phases. Classification of uses is itself a development of a system in planning, and is developed further in coding for computer and other processes. The amount of data needed is massive, the complexities of recording it and keeping it up to date are many, and the variables in its use are extensive. Modern tools and techniques, most recently the electronic computer, are brought into play.

The present stage of technique is not yet advanced far enough to resolve the work by computer or even firm numerical standards. This is especially true in open space planning which has had least attention up to the present. But there are guides which can be of help now as indicators and reference in meeting the problems which must be faced now.

Measurement and Judgement

Planners have made recommendations, from time to time, as to how the two physical requirements of location and amount can be resolved—location by distance or time required in transit, space by density of development. Planners usually call these "de-

sirable" standards—"an excellence of quality somewhere between the minimum and optimum situation . . . in this sense standards are not absolute, but more in the nature of . . . criteria to be followed under average circumstances. Where there is a marked range of variation in circumstances, variable standards . . . may be warranted."

It is clear here that the judgement of the professional is the operative factor. The planner's "standards", however, may be misinterpreted as rules and regulations which are universally applicable in planning situations. A reliance upon "objective" measurement has come to replace the considered judgement of the professional. It has been found, for example, that the general limit of distance between residence and work keeps within 45 minutes to an hour, whatever the mode of transportation may be. Yet there are innumerable instances where this is considered an intolerable time for use on the journey to work, and on the other hand, where this is ignored as a limit in actual location of home and work place. Still, those "standards" which are currently in use represent an average situation and are helpful as starting points in assessment of open space needs,

The Use of Guides

Most useful in the development of a new concept and particularly for open space planning are guides emerging from past application and case histories, in suggesting parallel present applications and which can point to future study and consideration. Open space as a land use has been neglected in previous standards and planning guides. Most information has dealt with limited areas such as recreation areas or schools, often unrelated to the total open space needs of the community. These in general are what may be referred to as the "classic standards."

The guides for open space planning are not so much in the calculation of amount of land or location of land for open space purposes, but in the patterns of development. These can best give the indication of the kind and location of open space uses and can help lead to assessment of amount.

THE "CLASSIC" STANDARDS

The standards which have been developed most with some relationship to open space are those on

recreation, parks, schools, residential density, and industrial and commercial development. These standards have been developed from those prepared by national groups, associations, and institutions, from proposals by planners as embodied in plans, and by studies of existing and changing conditions. They are admittedly crude and represent for the most part the "desire lines" for the various uses. They are useful for reference and for a "starting point" in the task of evaluating a specific situation.

Recreation and Parks

Space needed for recreation areas is estimated by two criteria: population served and site size.

The National Recreation and Park Association has long been regarded as a leader in suggesting standards for recreation. NRPA recommendations have been adopted by many cities, although the NRPA notes that in the last few years there has been a tendency to increase the space requirements. The basic minimum NRPA standard at the metropolitan scale is one acre of recreation space for every 100 population, present and estimated, generally within or immediately adjacent to the city.

Planners have recognized that cities over 500,000 population could perhaps tolerate lesser amounts of public recreation space per capita, chiefly as a matter of practicality rather than desire. The variations on the population base range from the basic 10 acres per thousand to 20 acres per thousand, with a general standard that can be taken between 12 and 15 acres per thousand population.

There are a number of facilities found in major urban areas for which no fixed standards are avail-

able: botanical gardens, zoos, fairgrounds, stadiums, coliseums, arboretums, and the like. These are developments of a type within the total recreation or park space suggested by the standards, although some cities naturally increase the variety as well as amount of publicly accessible open space by providing these in addition to the areas suggested by the standards. Some metropolitan areas also provide other facilities such as a planetarium, aquarium, art museum, sports arenas and gardens.

Of the variety of recreation space provided by a city, NRPA reports that a generally adopted reference is for at least half the total to be in major parks with natural settings. Another $\frac{1}{4}$ should be in neighborhood parks. In many cities the final quarter is also devoted to quiet parks in beautiful settings, although some prefer the final $\frac{1}{4}$ to be devoted in close-in playfield-type development.

Schools

Standards commonly used include an accepted desirable total school size for different age levels:

Elementary Schools: 350-500 pupils

Junior High Schools: 700-1,500 pupils

Senior High Schools: 1,000-2,000 pupils

Location of the elementary school is based upon the neighborhood unit. Generally, the walking distance to an elementary school is accepted as $\frac{1}{4}$ mile optimum, $\frac{1}{2}$ maximum. For junior high schools the radius of area served is recommended as $\frac{3}{4}$ mile, with a maximum of 1 mile.

Distance standards for school location are less certain with the increased use of home automobile use

Table 1—Areas for Recreational Development

Type of Facility	Size/100 population served	Desired site size
Regional park or reservation.....	1,000-5,000 acres	5-10 square miles
Major natural park for multiple use.....	500-5,000 acres
Major parks	3 acres	100-300 acres to serve 50,000 population
Community parks	1 acre or more	20-50 acres to serve 20-30,000 population
Community park—School	1 acre or more	10-20 acres elementary; 20-40 acres Jr. High; 40-80 acres Sr. High
Playfield	1-2 acres	25-30 acres to serve 20,000 population
Neighborhood park or playground.....	1 acre	1-3 acres depending on density of neighborhood; 1,000-5,000 population served
Play lot—tot lot	1 acre/300-800	2,500 sq. ft. to 5,000 sq. ft.

Table 2—General Standards for School Site Sizes

Type of School	Minimum (acres)	Desirable Minimum (acres)	Preferred range (acres)
Elementary	5	5 +1 per 100 ult. enrollment	10-25
Junior High	10	10+1 per 100 ult. enrollment	25-50
Senior High	20	20+1 per 100 ult. enrollment	40-100

and school bus facilities. There is also a trend toward the campus school which may provide facilities for all ages with virtually complete school bus service.

There is also some pattern of combination school park-recreation facilities for multi-purpose uses of the site for full-time use and supervision the year round.

For the campus plan of combined school facilities, an area of 40-80 acres is desirable. For combination school-park-recreation facilities 10-20 acres should be planned for the elementary level, 20-40 for the junior high school level, and 40-80 for the senior high school. Admittedly, there are existing examples which are less than these sizes, but these suggested are desirable particularly for the planning of new areas.

Streets and Parking

Streets and parking are in themselves open space uses and represent a substantial part of an urban area.

Street space standards usually refer to the right-of-way required to handle the varying amounts of traffic.

Table 3—Minimum Right-of Way Widths for Rural Sections of Interstate Highway System

Type of Highway	Minimum Width in Feet	
	Without frontage roads	With frontage roads
2-lane	150	250
4-lane	150	250
6-lane	175	275
8-lane	200	300

A general list would include both urban and rural types of rights-of-way. (See table 3.)

These are the standards accepted by the American Association of State Highway Officials. It is considered good practice by AAHSO to acquire rights-of-way wide enough to accommodate the ultimate expected development. The Interstate Highway System has been built on a design standard which assumes full use by the projected amounts of traffic for 1975.

Definitions for various types of highways have been prepared by AASHO:

Expressway: a divided arterial highway for through traffic with full or partial control of access and generally with grade separations at intersections

Freeway: an expressway with full control of access

Parkway: an arterial highway for noncommercial traffic, with full or partial control of access, and usually located within a park or a ribbon of park like developments.

Although these apply to rural conditions as well any one of these types of highway may be located in an urban area. The other types listed below lack the features of access control:

Major street or major highway: an arterial highway with intersections at grade and direct access to abutting property

Through street or through highway: a highway on which vehicular traffic is given preferential right-of-way by traffic control devices

Local street or local road: a street or road primarily for access to residence, business or other abutting property

Streets in developed residential areas may use up to 25% of the land area, and the amount of land used for streets and highways may be in excess of that figure in many cases. Express highway intersections in cloverleaf or other interchange patterns use substantial amounts of land—up to 80 acres or more in some cases.

In city centers where the basic grid street pattern takes considerably more land for streets than the design suggested for residential subdivisions, the streets alone may consume upwards of 30% of the total land area. Parking, in addition, uses significant amounts of land. It is revealing in many cities to see from the air how much of the central city and other parts is given over to surface parking space. The automobile requires from 300 to 350 square feet of space, and an acre of land will be needed to park from 100-150 cars.

Parking ratios may be related to employment—with a ratio often of 1 car per person to building floor space—residential ratio of 1 space to 1 dwelling unit is standard, 2 spaces per dwelling unit in many cases even in downtown locations, while for commercial uses the parking ratio is 2-4 square feet of parking space needed for every 1 square foot of shopping area.

The amount of parking space needed in any given situation can be estimated in relation to the type of building uses, the median number of cars per family in the area, and the local habits.

Development and Density

There are many "standards" guiding the determination of land needed for industrial, commercial and residential development. In practice these essentially relate to the density of use.

For industrial space needs, for example, one basis for estimating amount of land needed is the amount of land needed in relation to the number of workers, which would vary, of course, with the kind of industry. For crude estimating of such lands, an over-all density of between 20-30 workers per gross acre (gross acreage including parking) is suggested.

More pertinent, where large amounts of new land may be required or requested for industrial expansion, consideration should be given to the possibilities of planned industrial districts or parks where more accurate and detailed estimate can be made of the total land need, including streets and accessory land. The greater number of these districts are in tracts under 500 acres.

Commercial land uses are usually broken down into three general types for purposes of estimating space needs—the central business district, the outlying shopping center, the neighborhood or highway service centers. Estimates are based on population figures and business activity—that is, the market, actual or projected. The chief measurement of use in relation to open space is in reference to parking and parking ratios.

In most widespread current use are standards which relate to suburban or neighborhood commercial space, most often used in connection with new development.

Development needs for residential areas bear a more substantial relationship to open space needs than any other type of generalized land use—mainly since it is presently such a large percentage of developed land in urban areas. Residential needs are directly related to density. The general standards recommended by the Committee on the Hygiene of Housing of the American Public Health Association are shown in Table 5.

For residential areas as a whole it must be remembered to add in what is needed for schools, neighborhood shopping, streets, recreation, open space, etc. when using this type of standard. This is not to say that higher or lower densities are not acceptable. Many cities have examples at both extremes.

Table 4—Crude Standards for Estimating Space Requirements of Neighborhood and Community Shopping Centers

Selected Neighborhood Population Sizes in Residential Communities of 30-50,000	Acres of Combined Community-Neighborhood Shopping Area Per 1,000 Population at Various Parking Ratios		
	2 : 1	3 : 1	4 : 1
5,000.....	0.7	0.9	1.1
2,500.....	0.8	1.0	1.3
1,000.....	1.1	1.5	1.8

(A parking ratio is the amount of square feet of parking space for every square foot of ground area covered by store buildings.)

Table 5—Residential Densities Recommended by The American Public Health Assn.

One- and Two-Family		DU's Per Net Acre	
Dwelling Unit Type	Desirable	Maximum	
1-family detached	5	7	
1-family semi-detached or			
2-family detached	10	12	
1-family attached (row) or			
2-family semi-detached	16	19	
Multi-Family			
2-story	25	30	
3-story	40	45	
6-story	65	75	
9-story	75	85	
13-story	85	95	

This trend is toward greater amounts of usable open space through more sensitive arrangements of dwelling units on the land, whether in 1-story single-family structures or in high density towers. The old standards are continued in the newer designs only in the matter of total densities. Cluster development and new towns illustrate this trend of planning large areas at one time—in planned unit developments.

Open Spaces in Percentages of Over-all Land Uses

Studies of the amount of land in a given use as compared with the "total area" have been made for numbers of cities and areas, but are useful as rough indications only. The base data has varied because of the variance in cities and the area taken for study, most often limited to municipal boundaries. Data collecting and land use survey techniques need to be developed particularly for open space uses.

Open space elements in the studies are found under "streets," "parks and recreation," and "undeveloped" and "vacant" areas. A major study in 1955 on 58 central cities showed about 40% of the land used for residential, about 30% for streets, about 7% in parks and recreation, 10% in public and institutional use, only 3 plus % in commercial use, 10% in industrial and railroad use. About 55% of the total land was considered developed and 45% considered "vacant."

For 33 satellite cities the percentages did not vary widely.

Probably most concern has been given to parks and recreation uses. An early proposal assumed that 12½% of the total area should be devoted to parks. More recent suggestions have been on the order of 10% of the total urban area assigned to recreation space. In larger metropolitan areas or regions this percentage may be lowered (in New York regional area about 5% of the region—not counting regional scale open space) but there is positive concern for including as part of the park and recreation totals other regional requirements such as:

1. In addition to 10 acres/1000 population of a city, there should be for each 1000 people in the region, 10 acres of park land in stream, valley, parks and parkways, large scenic parks and forest preserves under municipal, county, state, federal or other authorities.

2. In addition to the recreation acreage within the urban area there should be at least 10 acres of reservation or recreational area left in their natural state for each 1000 persons.

When all types of open space are taken into account, the percentage of open space to total area must be kept large to meet the standards desired for parks and recreation, streets and other urban open spaces.

In new town planning and regional planning, and in planning areas where agriculture and other extracurricular uses are predominant, the percentage of open space will be larger. Of the 50% minimum in urban areas, not more than 30% should be allocated to streets and corridor spaces (the aim in planning should be less), 10% in parks and recreation, 10%, in other green space and utility and multiple-use open space, as a minimum.

As a precaution these over-all percentage figures must be considered only as a crude guide in the beginning of evaluation of land use requirements: location, the individual local situation, trends of development and other variations must be kept in account. The important consideration is to make specific assignments of open space use in the total area and not leave land designated as only "vacant" or "undeveloped."

DEVELOPMENT PATTERNS AND OPEN SPACE

Standards of quantity are important; for decisions must be made with regard to the amount of land to

be assigned for uses. Of equal importance are the patterns of development; as these both affect and are affected by the open space uses.

New development patterns particularly are significant in the amount and arrangement of open space allocation. There is a growing understanding—by private developers, government officials and planners—of new types of development; especially for completely planned or designed areas where mixes of types and uses can be advantageously put together: the roadside commercial strip is giving way to the planned shopping center; individual and scattered industrial plants are being planned in industrial parks; the residential cluster, the new town, the planned unit development introduce new relationships of open space and building development use; and the use of green belts, greenways and the preservation of natural features are in the picture as a way to control urban growth and provide more desirable and valuable building sites.

The problem is therefore not only "how much" but "where" and "what kind" in development and open space planning.

The "Straight Vanilla" Subdivision— Parcel and Lots

The general practice of subdividing land for suburban expansion was based on the widely accepted urban gridiron pattern—streets at right angles, each block two lots deep, sometimes with an alley through the middle of the block, sometimes without.

This pattern is the easiest one for division of land for sale but not always the most efficient one for use, since the proportion of street area to lot area may be too high in relation to land use demands. Furthermore, this pattern may not be related to open space characteristics of an area—each parcel or land holding may be wholly or arbitrarily divided into a grid pattern without relation to other parcels (subdivision

leap frogging) or without relation to natural ground form and grade.

Change in the straight gridiron pattern began to be evident in the 1930's, especially with the introduction of the curvilinear street, larger blocks and some public open space reservation. The Federal Housing Administration has had a large share in these changes in its requirements, published guides and standards for subdivisions, and advisory consultive service for review and revision of proposed subdivisions. (See Figure 2)

The average lot size in subdivisions has steadily increased. Today $\frac{1}{4}$ acre is typical in many subdivisions. Two-thirds of all the vacant land in the New York region is zoned for half-acre lots or larger.

The densities are rather low and there is a good deal of open space—space that is not built upon—as illustrated by Tunnard-Pushkarev in table 6.

The kind of subdivision of relatively low density represents a good deal of open space—yard space and the associated street space make up a predominant part of the land use with only 5 to 25% given over to building use. The open space is divided into small pieces, and limited to immediate family use.

Unfortunately, as Tunnard-Pushkarev point out:

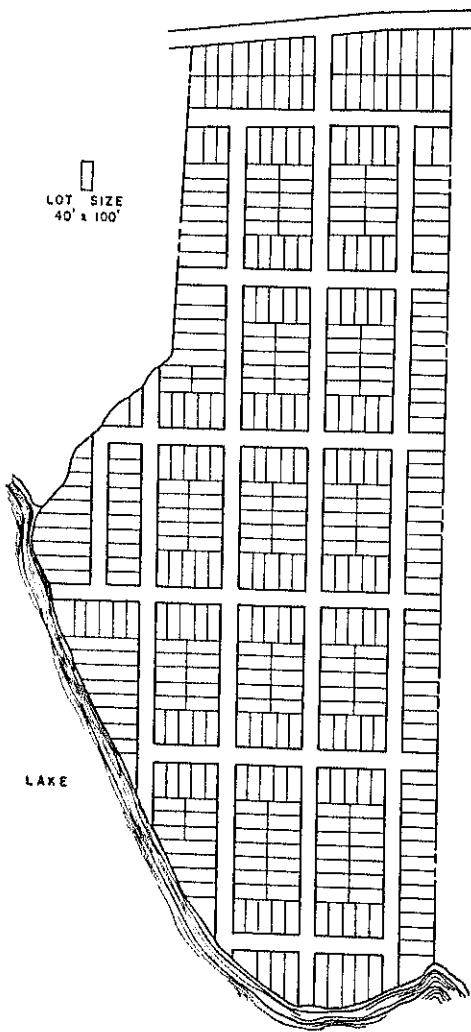
"... some of the ideas, meant essentially as illustrations of principles, ossified into misapplied rules and cliches, used without meaning or purpose. After World War II and up to the late '50's, land planning ideas were not further developed either on the federal or on the private level, as a result of which most of the postwar residential development became a scaleless mass of uninspired design exercises in asphalt and concrete, safe to be sure, and more efficient, but not much more interesting or less arbitrary than the patterns they replaced."⁶

Air views or plans of subdivisions like these show the even spread of houses across the land. Each house

⁶ Tunnard, Christopher, and Pushkarev, Boris. *Man-Made America*. (Yale University Press, New Haven, 1968) pp. 90-91.

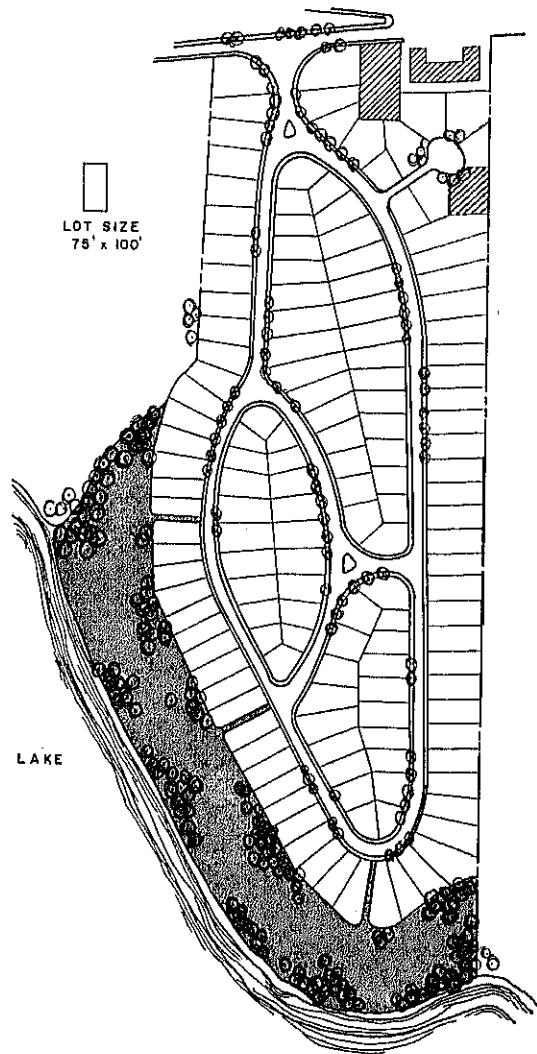
Table 6—Comparative Residential Subdivisions

Lot Size	Net Density	Net Coverage	Place
5,000 sq. ft.....	about 8 families/acre	about 30%	Lakewood—Long Beach, Calif.
7,500 sq. ft.....	about 6 families/acre	about 17%	Port Charlotte, Fla.
10,000 sq. ft.....	about 4 families/acre	about 12%	West Hartford, Conn.
20,000 sq. ft.....	about 2 families/acre	about 8%	Fairfield, Conn.



TYPICAL SUBDIVISION PATTERN

For this type of subdivision plan is marked by excessive amounts of street construction, lots blocking the shoreline, and no open space.



REVISED PATTERN

This revised plan, though of fewer building lots, provides amenities of better building lots, and preservation of the shoreline in community open space.

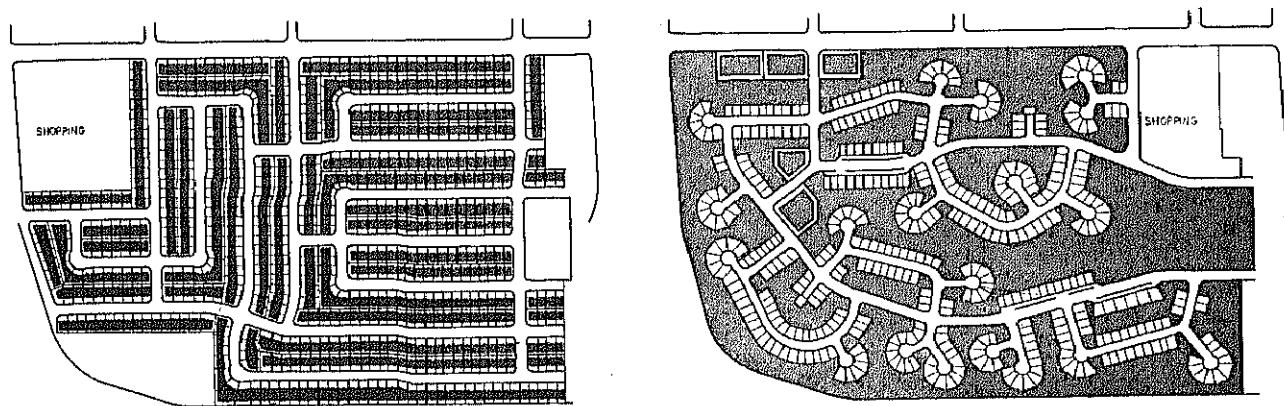
FIGURE 2—*Alternative For Subdividing*

is in the middle of the lot, a little more yard in back than in front. Each yard is probably much like the other, and the natural land form, as well as the tree, may have been bulldozed away. What remains is hundreds of little parcels all exactly alike, each with a house which differs little from its neighbor—the "straight vanilla" subdivision. (See Figures 4 and 5)

Cluster Development

A cluster development is one in which a number of dwelling units are grouped, leaving some land un-

divided for common use. It may mean grouping the same number of units allowed in a given subdivision or zoned area on smaller than usual or minimum lot, with the remainder of land available as a common area—the density remains the same, but some larger pieces of land, hopefully with some interesting natural features such as a creek or wooded hillside, left undivided and uninvaded and open for common use. Cluster development will be found increasingly in use and may become the dominant pattern of residential development.



CONVENTIONAL SUBDIVISION

32	Acres in streets
22,500	Linear feet of street
29	Percent of site in streets
80	Acres in building sites
590	Dwelling units
0	Acres of usable open space

CLUSTER SUBDIVISION

24	
16,055	
19	
41	
604	
51	

FIGURE 3—Comparison of a Conventional Subdivision and a Cluster Subdivision¹⁰



FIGURE 4—Rectilinear Grid Subdivisions Salt Lake County¹¹

¹⁰ Excerpted from "The Common Green" brochure, limited edition published by Santa Clara County Planning Department, 1981.

¹¹ Photograph by P. King, Institute of Urban Studies and Services.

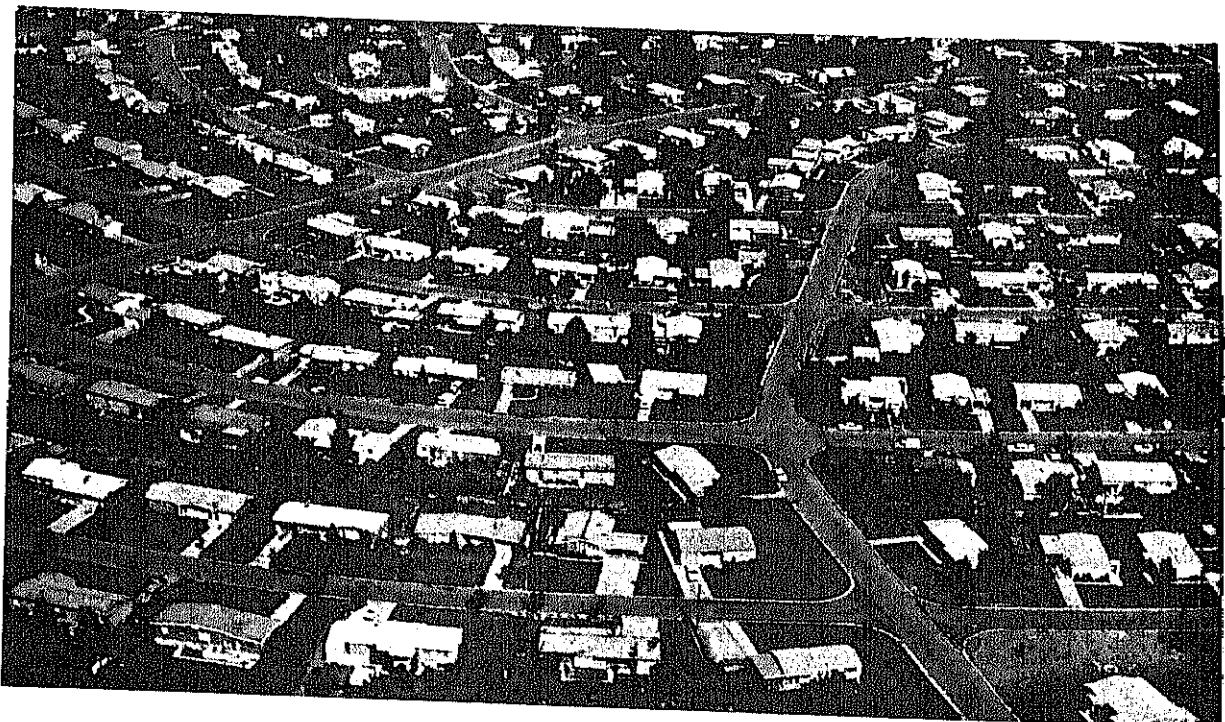


FIGURE 5—*Curvilinear Grid Subdivision: Salt Lake County*¹²

Common open space is the key element. This may be a recreation core or a park-like natural area.

Development costs are lower since there are fewer for developing and less linear feet of utilities for dwelling. Sewerage is cheaper and there is less runoff with cluster since there is less paving and more ground surface to absorb water. Cluster can also concentrate building where drainage can best be handled, leaving natural water courses and the drainage network in its natural state. (See Figure 6)

The open space element in cluster development in its best use is part of a general open space system, rather than a series or collection of isolated areas. The open spaces of the cluster pattern are far more effective and should be planned to connect with public open spaces such as parks and schools and with open space arrangements of other developments or subdivisions. (See Figure 7)

A key question is the ownership and management of the open space areas in cluster development. The common open space is primarily for the people of the development and while it may benefit the community at large, it should not be used as a substitute or alternative to other public spaces needed for parks, schools, and other civic facilities or improvements.

The cluster common area may be deeded to the public, or (as is considered best by some) owned cooperatively by the homeowner through a Home-

owners Association, or maintained through the formation of a special district. The design arrangement may be formal, as in Figure 8, or informal, as in Figure 9.

Zoning now includes cluster provisions. One example is that of Brookline, Mass.:

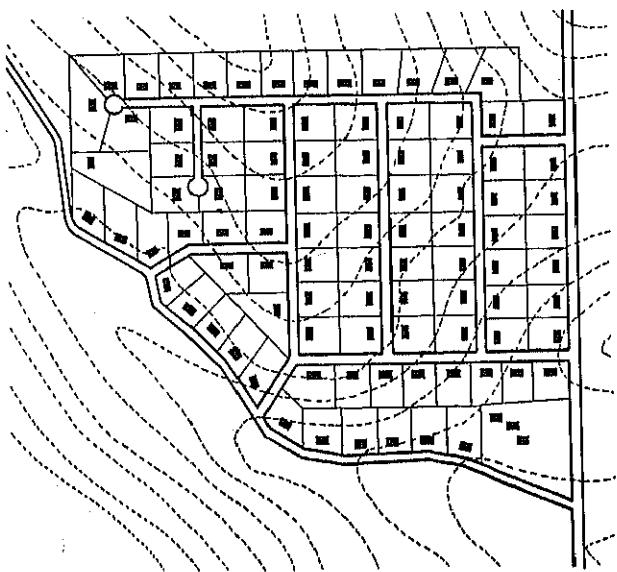
"... land is (to) be set aside within the subdivision and either deeded to the Town as permanent open space or covenanted to be maintained as permanent open space in private or cooperative ownership, the area of such land to be not less than the difference between the total area platted in the subdivision and the total area which would have been so platted if all lots were of minimum lot size . . . etc."¹³

Planned Unit Development

The planned unit development is slightly different than cluster, although the basic principle is similar. Both seek a more flexible approach to permit development of large areas as a whole. Cluster usually is limited to residential development, permitting a higher density if the resulting open space is legally

¹² Photograph by P. King, Institute of Urban Studies and Services.

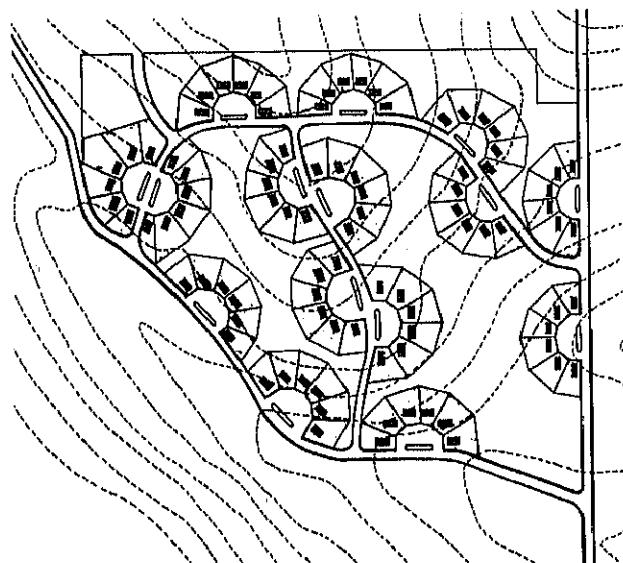
¹³ *Zoning By-Law for Brookline, Massachusetts*; (Minimum Lot Size in Sub-divisions of 10 Acres or More) Section 5.11 (1962) p. 20.



1. *Rectilinear Plan*—94 lots, 12,000 feet of streets and utilities.



2. *Curvilinear Plan*—94 lots, 11,600 feet of streets and utilities.



3. *Cluster Plan*—94 lots, 6,000 feet of streets and utilities.

FIGURE 6—*Advantages of Cluster Design*¹⁴

permanently open. The advantages of cluster are also characteristic of planned unit development. A further advantage comes from a design freedom which is not

¹⁴ Diagrams are redrawn from designs by Myron X. Feld, planning engineer, as they appeared first in *American City* magazine and then in Tunard's ad in Pushkarev's *Man-Made America: Chaos or Control*, p. 381.

possible under single lot-single building consideration.

Planned unit development is a broader concept than cluster. It may apply to commercial and industrial as well as residential development areas. In some cases a mixture of uses—one or more residential types of residence plus commercial—is allowed. A major

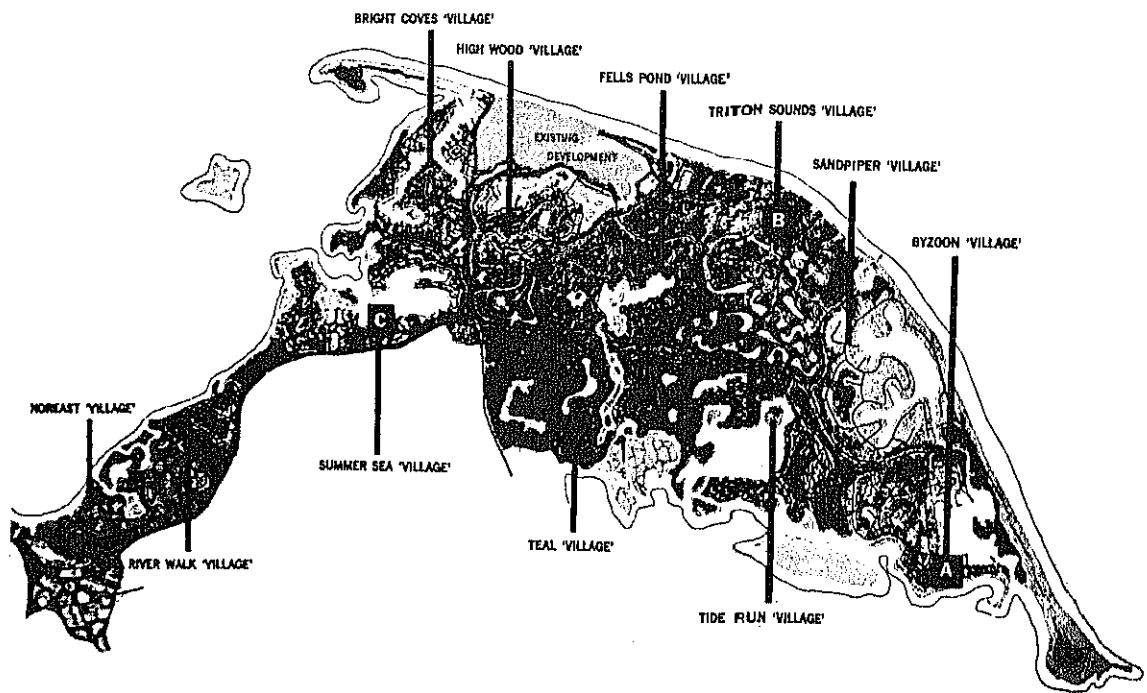


FIGURE 7—*New Seabury, Massachusetts—Approximately 60% of the land is preserved in open space of shore, water and woods.*¹⁵

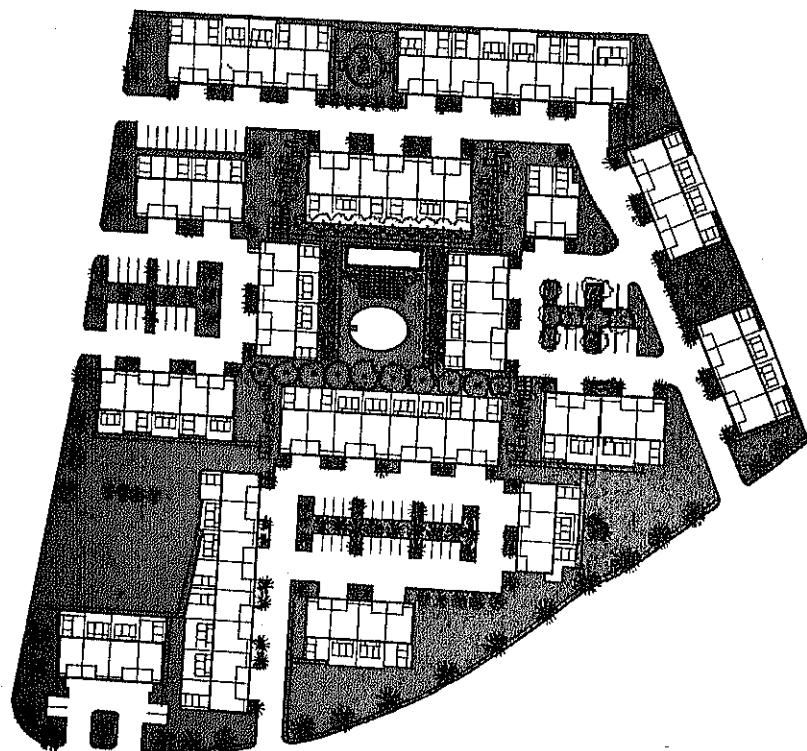


FIGURE 8—*Planned Unit Development Pomeroy Green near Santa Clara, California*^{16a}

¹⁵ Strong, Ann Louise, *Open Space For Urban America*. (Urban Renewal Administration, Department of Housing and

Urban Development, Washington, D.C., 1965) p. 114.
^{16a} Whyte, William H. *Cluster Development*, (American Conservation Association, New York, 1964) p. 57.

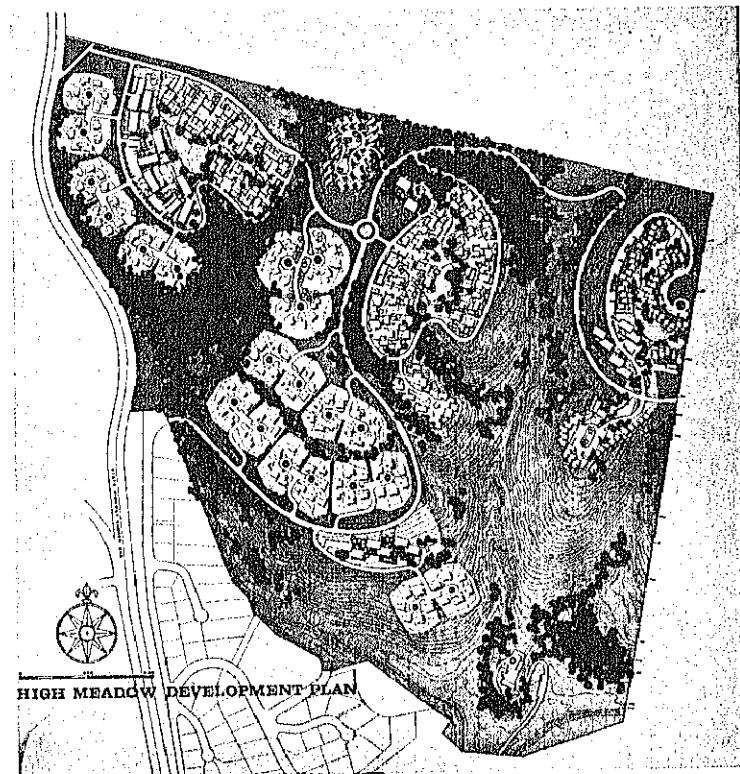


FIGURE 9—Planned Unit Development High Meadow near Carmel, California¹⁶

difference between planned unit development and cluster is that the specific condition under which the development will be allowed are general in nature for planned unit development, and frequently not applied until actual plans are proposed. In this case, much is left to the discretion of the administrator, the review board, or other controlling authority.

Administrative discretion seems to be one of the larger problems of planned unit development. The real problem is recognition of and a framework for relating planned development and comprehensive planning.

The planned unit development has three major characteristics:

1. Planned unit developments usually involve areas and undertakings of large scale, ranging from campus type developments planned as a whole to new towns.
2. They usually involve a mixture of uses and types. The single use or type falls more into the class of the more usual subdivision.
3. They usually involve stage-by-stage development over a relatively long period of time during which buildings, arrangements and uses may have to be replanned to meet the changes of requirements, technology, financing, or even concepts.

¹⁶ Ann Louise Strong, *op. cit.*, p. 115.

In the planning of the planned unit development, great emphasis can be given to the structuring of the plan in meaningful open spaces—roads, parks, and the other open spaces that make up an open space system—rather than on the rigid detailing of building development—in order to leave room for flexibility and change in building development, to provide different “mixtures” and to provide a basic control in stage by stage development. (See Figure 10)

The Mix

Traditionally, the city, large and small, was a place of mixture. It brought together a wide variety of people and activities in a relatively limited space. People came to the city to be part of this mixture.

The desire to reduce congestion, the need to escape adverse effects of an unplanned and uncontrolled environment and the expansive growth of the urban areas were among the forces that led to a general separation of uses in zoning and otherwise. Segregation seemed to be in order in all respects.

Today there is a search for a freedom to mix and this is reflected to some degree in planning. The uni-



FIGURE 10—Planned Unit Development: Santa Cruz Campus. General Community Development is planned around open spaces of a variety of types.¹⁷

¹⁷ *A University of California Campus at Santa Cruz*, (A prospectus prepared for the Regents of the University by the City,

County and community of Santa Cruz) Lackey, Lawrence, A.I.A., Wrong, Worley K., Campbell, John C., and Royston, Hanamoto and Mayes. Undated.

formity of suburban development has been under attack and there are an increasing number of examples of mixing of types and uses, especially in large scale development, the mixture of single family, town house and high rise apartment house; the provision of shipping, institutional and other non-residential uses in residential development. The planned unit development is an attempt to find a flexible means of re-introducing diversity and mixture in newer urban growth.

Traditionally, too, open space is the setting for the mix, in the streets, plazas and squares of older cities where people of all kinds mixed and still do. The larger recreational areas and public parks also serve this purpose.

"Mix It Up: Another thing I noticed was the most interesting open spaces were those in which several currents of life came together—working-class people, well-dressed junior executives, mink-stoled ladies at their shopping, and above all, children, who add a quality of noise, excitement, and vibrancy to the urban scene that is altogether indispensable.”¹⁸

Open space both in the past and now offers a key to the mix in planning in two ways:

1. *Open spaces provide the area where the mixture of people can take place.*
2. *Open spaces provide the control for building development mix, so that different densities, different types, and different uses can take place with open space serving as needed physical framework and as the space for compensating and adjusting common uses.*

Open space will then play an increasingly important role in the planning of new towns and urban growth generally where mixtures of diversity, type and uses are sought.

New Town Concepts

The expansion of central cities, and the distressing character of urban fringe development, began to stimulate new thinking as some of these problems became apparent in the Victorian industrial centers in England. The original proposals for new towns were, to be sure, romantic in conception. A population of the right “mix” was to be isolated in the green countryside in a complete environment—farm, residence, factory, stores, schools, churches, and recreation. There were trial attempts at establishing such new towns and some were successful—Letchworth, and Welwyn,

Ebeneezer Howard’s garden cities, are delightful even today.

The first reactions to the new town concept in the United States took the physical form of residential suburbs. That is, the distinguishing physical elements of green space, lower densities, vehicular separations and a more or less nostalgic country air were appropriated for residential development on the urban fringe. Several of these pioneering developments of the twenties and thirties have been extremely successful. The greenbelt towns—Greenbelt, Maryland; Greenhills, Ohio; and Greendale, Wisconsin—are still today very fine residential developments.

Other attempts in planning of complete new communities have been made, such as Park Forest, Illinois, where the new town would provide not only suburban residential living but a full complex of urban facilities and activities for work, play and institutions as well as dwellings. In England and other places in Europe, this concept has been carried far in the development of new cities with industrial base and sensitive development of commercial and recreational spaces.

In this country the new town concept is again emerging as a way to meet urban growth, among other things to make the best use of land. It is estimated that our present rate of urbanization at 30 acres per hundred people would take 10.5 million acres to provide for 35 million people—that 350 towns at 100,000 inhabitants each would consume only 3.5 million acres based on examples of new towns of low density with abundant open space, and would use only 10 acres for a hundred people.

A recent example is Reston, in Fairfax County, Virginia, a projected new residential city of 75,000 people. It is a true cluster plan with houses concentrated in seven villages of about 10,000 people each. There will be golf courses and lakes. The first section of 25,000 units in three town-house clusters has just been completed. The significance of this project is two-fold. It does provide for a mix of people—different family sizes, different age groups, different incomes—in different physical settings. Further, it is located in open countryside, 20 minutes from Washington, D.C. Significance lies in the fact that there is a projected “Plan for the year 2,000” for Washington, which proposes that the inevitable growth of the region be accomplished through the establishment of satellite cities, rather than by uncontrolled urban sprawl. The pattern is exemplified in Reston and other similar developments in the area, such as Columbia, Maryland, planned for ultimate population

¹⁸ *Exploding Metropolis*, Clay, Grady, op. cit., p. 152.

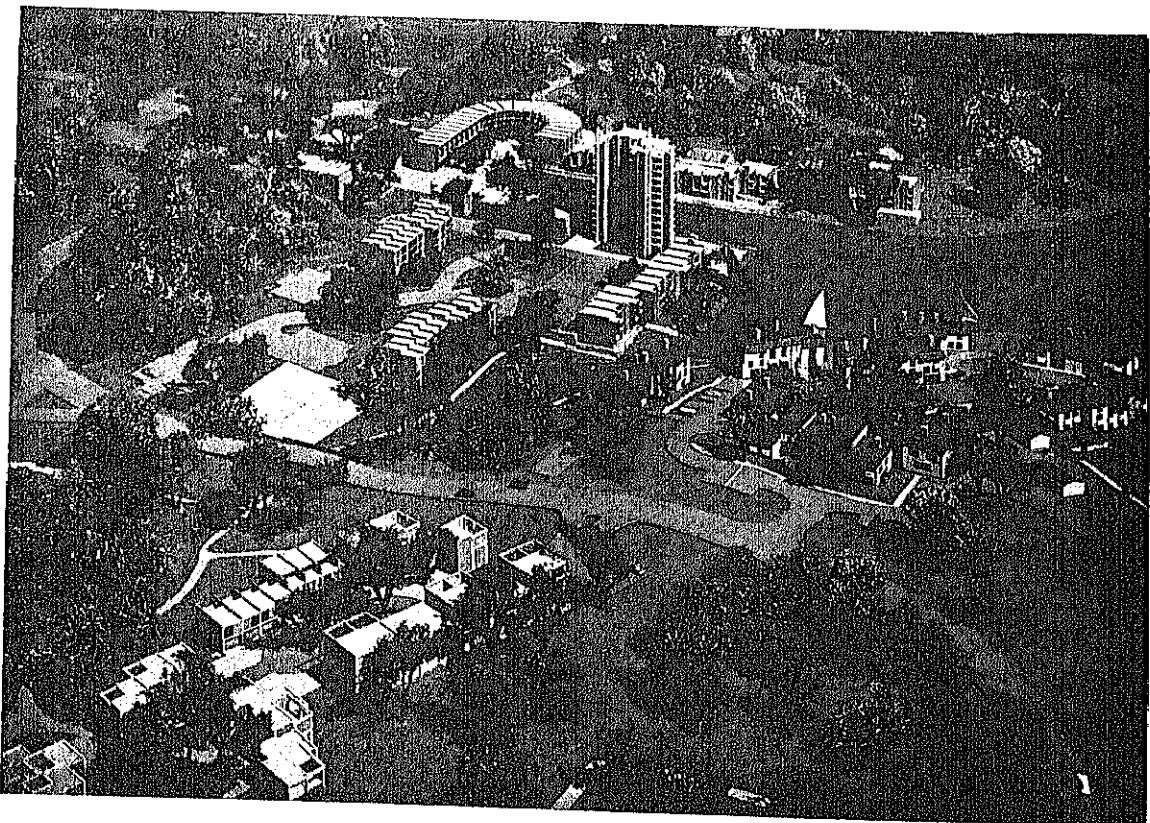


FIGURE 11—*New Town Development: Reston, Virginia*¹⁹

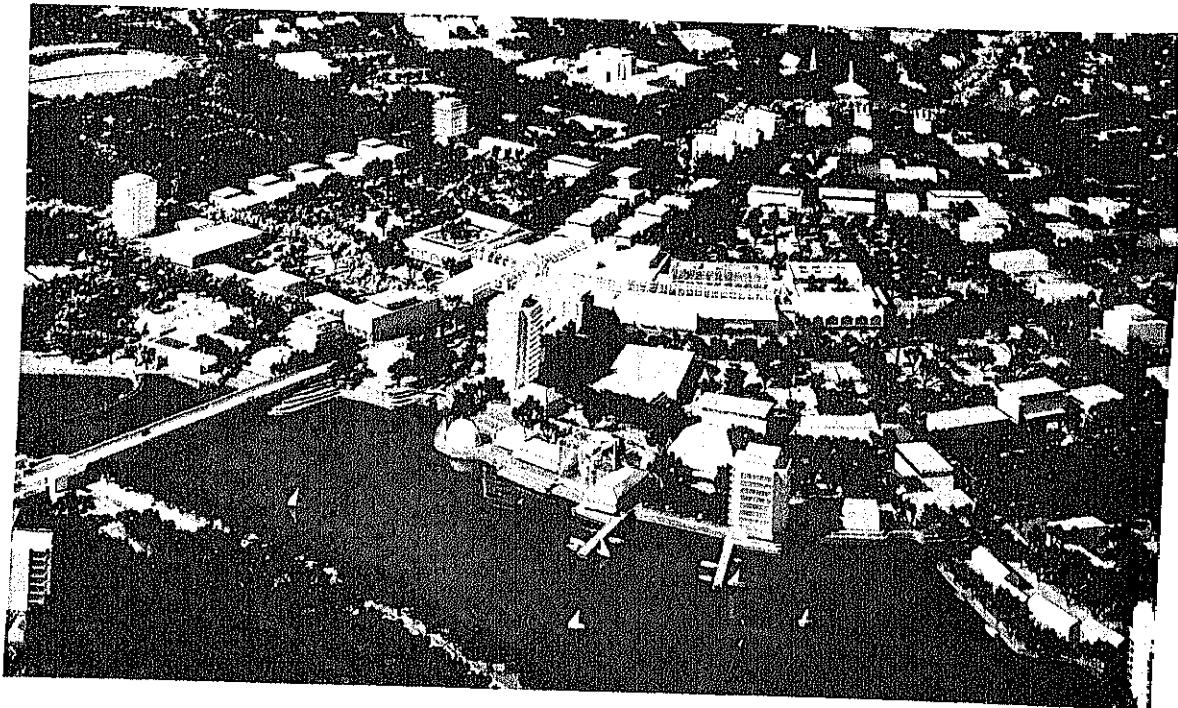


FIGURE 12—*New Town Development: Columbia, Maryland*²⁰

¹⁹ Photograph of model by Louis Checkman.

²⁰ Photograph of model by Ezra Stoller Associates.

of 110,000. (See Figures 11 and 12)

Reston has a total of 6,810 acres of which 1500 are to be in common lakes, parks, common greens, etc. It will provide for all types of units, the First Village planned for 143 detached houses, 227 town houses and a tower containing 61 units, and the village center at the end of a lake is planned with an apartment tower and shops. Ultimately it is hoped that light industry, research parks and cultural facilities will be part of the fairly complete city.

The plan is based on a cluster system of seven villages with intervening woods and meadows left open. There will be five golf courses and two lakes for boating and fishing. The plan carefully respects the natural drainage network.

There are currently perhaps more than 100 new town developments, many in the western states, few in the sense of complete cities, most representing large scale residential communities but they follow the principles of planned unit development and the cluster idea.

There are two fundamental open space concepts in the new town idea:

1. *They include the greenbelt principle, that is the use of green space (which may also serve multiple open space use) to define and control development. In this sense they usually provide for a green belt system around the town and around or between its component parts.*

2. *They provide for a maximum of open space for common use which at the same time compensates in open space for compact building development.*

It may be expected that new town concepts will be increasingly applied in the western states, perhaps with an initial emphasis on the metropolitan and urban area but also in the most undeveloped areas in connection with new mining and other development.

Open Space Element in Development

Open space has a functional use in itself, as a land resource, as a land use for recreation, as a corridor space for transportation. It also has a functional use in development, while serving these functions, in providing for a system of control in building development patterns. The open space elements of development can become the key to better or poorer planning of urban and suburban growth.

In building development, the way open space elements are used or deployed determines the character and quality of the development and are the key

factors in the efficient use of land in development.

It is the use of the open space elements that such development patterns as cluster, planned unit development, and new towns have shown the ways to build more desirable communities, with greater economy in development, and with general acceptance by the market, by people who live in them, by the builders who build them, and by the officials who have to pass on them.

It is, therefore, of great importance that a full understanding of these open space elements in development be acquired for the assignment and allocation of land uses, as a guide to the disposal of land for development.

SEPARATORS AND BUFFERS—Separators and buffers are open space lands which are used to separate incompatible elements or one type of land use from another,

- (1) for practical reasons of controlling such conditions as noise, fumes or haphazard traffic access;
- (2) for aesthetic reasons of identifying and defining areas.

They may be in the form of planned areas of open space in themselves, whether for single or multiple use (separators) or as open space *edges* (buffers). While they serve to separate, they at the same time can also be unifying elements in providing continuity of open space systems, using golf courses, lakes, streams, parks and other open space uses in the systems.

The size of separators and buffers will depend on the particular function they serve in a particular situation. Size will depend also on whether the element is used narrowly as buffer or whether it is also used for multi-purpose open space such as recreation and park use as well.

There are a number of types of separators and buffers.

1. *Greenbelts.* These are in general continuous green open space to define development areas at large scale. They are generally considered open country or natural areas, to limit the area of planned development, but at large scale especially are best used for multi-purposes. They may accordingly provide for major trunk intercity highways, parks and recreation and utility open spaces including farming and forests. They may also be considered as locations for secondary open space use such as educational and other institutional campuses.

2. *Green ways.* These are green space penetrants, fingers, or wedges, that may follow drainage ways or other natural forms, usually best used in linking up with other elements of an open space system.

3. *Corridor separators.* In some cases, an expressway system can be used as a separator or means of definition of a development. In such cases, the right-of-way should be sufficiently large to provide green space use for separation and buffering.

4. *Strip buffers.* These can be used to separate residence from highways and other traffic arteries, around commercial developments, parking lots. Size would depend on whether the buffer is planted or not. There is probably a minimum width of 30-50 feet for a densely planted buffer.

5. *Area buffers.* These may be used to protect one use from another adverse use such as residential from noise or fumes or nuisance, or to protect edges of water reservoirs.

CENTER PIECES—The center piece open space is that which is generally enclosed by development as a central focus of space for gathering and assembly or mixture of people and activities. Its functions are to give a sense of place and orientation as well as provide breathing space within development. It is a place to be, a place to see, to pause, to meet, to rest.

The center piece may be of any scale and any intensity of use from a small common green area of $\frac{1}{4}$ acre to a major park or a body of water. One of the trends in development today is the use or creation of lakes around which development can be planned as in the case of Reston, Virginia. Some secondary open spaces, such as a college campus, may be used and an even more familiar example is the use of a school or neighborhood park as a center open space. The general types are:

1. *Squares, plazas or malls.* These are traditional open space centerpieces long used in urban development at both large and small, intimate scale.

2. *Courts and patios.* These are familiar in residential development and are again becoming in common use in residential planning.

3. *Campuses.* These, whether at smaller scale of local schools or larger scale for institutions in the hundreds of acres, provide open space character to serve centerpiece functions.

4. *Parks and other national areas.* Such open green space areas are frequently used as development centerpiece: ranging from golf courses, lakes, recreation facilities either in single or multiple use. Landmarks or special identifying natural forms may sometimes be a strategic point for location of a centerpiece open space.

While the centerpiece is enclosed by development, it need not be isolated as an open space. Squares, plazas and other center pieces will be connected with the total open space system in the street system, and greenways can also be used to tie in the center piece open space as a part of the over-all open space sys-

tem. Certain developments in themselves with strong open space elements, such as large shopping centers with huge parking areas take on the function of center pieces.

DISTRIBUTORS—The distributor open spaces are chiefly the channels for movement but they also include the open spaces used to link up elements of an open space system, as in the case of creeks or other water ways, landscaped streets such as boulevards, and simple green strips. They are essentially the linear open space elements of an open space system. They link the different uses and various center pieces. They may be combined with buffers or separators as indicated or they may serve purely as distributors in themselves.

Distributors may also be the means to combine surface and multi-level uses in development and circulation. Overpasses, underpass and other structures to meet grade and multi-level purposes are involved in this use.

Distribution can serve more than one use, for circulation and for green space purposes. They include:

1. *Streets, highways and roads,* giving access through the landing spaces and the system of distribution both to development and open spaces.

2. *Waterways,* creeks and rivers and other water channels which link up elements of the open space.

3. *Other distributor greenways,* such as trails paths, and green space linear ties between other open space elements.

The Overall Pattern—Urban, Suburban, Exurban, Countryside, and the Mix

The application of the open space concept must come in daily detailed decisions. This is the level at which all concepts are proved or disproved. The intent of the concept is very wide in scope. It is primarily to use open space as a positive functional use to provide space and facilities to meet the open space needs of people; it is also a means to define and control building development in planning.

It would be of value then to take into consideration the overall pattern in which open space is not only allocated for specific open space uses but is also used to organize, plan, and direct development of other uses.

The overall patterns can only be generalized as types to give a sense of the overall scheme that may be developed. Certain it is that no one overall pattern will be used everywhere—different stages of development and different locations will influence strongly

older ideas and ideas from elsewhere will affect the local development. Of more importance is the fact of large metropolitan expansion and regional urbanization with development reaching far distances in relation to city centers. Because consideration must be given to regions and huge areas of large scale development, the matter of the over-all pattern is of significance as a guide to the more immediate and local decision.

The overall patterns can be generalized as follows:

1. *Dispersion.* This is a relatively low density pattern of spread based mainly on individual land holdings, in effect a continuation of the pattern that has been followed greatly up to now. It seems to be most easily followed in flat country. Frank Lloyd Wright's Broadacre city of the 1930's exemplifies this pattern. The open space characteristics are tied in mostly with individual holdings and the open space system is in a widely dispersed pattern of small areas. This follows a familiar pattern of uninterrupted suburban spread in all directions.

2. *Radial Pattern.* This retains a strong dominant central or core city with development outwards along radials which would be separated by open space wedges of the countryside as a basic open space system. Development would be essentially linear with suburban development interspersed along the radiating fingers.

3. *The Galaxy.* In this pattern, development would be bunched in relatively small units, each with an internal peak and each separated from the others by open space or development of very low density. Urban and suburban concentration would make up the units and possibly a kind of exurban development might be found in the areas between. The open space system would consist of a series of connected open space areas among and between the development area units.

4. *The Ring.* In this pattern a central area left open or at very low density would be surrounded by a ring of high densities or special activities like a wheel or doughnut. The San Francisco Bay area might be taken as an example and in Holland, for example, a national policy suggests the development of a series of cities surrounding open agricultural land. The open space system in this pattern would depend on some major open space area as the hole of the doughnut.

In all these patterns, the nature of the open space system would be the controlling factor and provide the controlling characteristic. While there may be some concern over different patterns, it would seem that the first of these, uncontrolled dispersion and spread will continue unless some positive point of view is developed in urban-growth, both in government and out. The new town approach is of major concern

f the cluster and planned unit development. What is also needed is positive policy for regional development and a positive open space policy based on the concept of open space as a control and structure for the development pattern can help establish the way in which urban growth can be met as it makes further demands on land.

PRINCIPLES IN THE USE OF GUIDES AND STANDARDS

Most standards containing numbers—sizes, distances, amounts—tend to be used as “minimum standards,” that is, the amount of land specified for a playfield, for example, is considered to be the lowest acceptable amount. The practice is related to problems of enforcement by public bodies—variable standards are difficult to apply and enforce through normal administrative practices. The concept of minimum requirements is thus generally in force.

Recognizing that specific applications will depend on a particular location or a specific local situation, standards are now couched in terms which include a range of possibilities. Some of the variations are based on population, some on other factors.

There has not yet been developed extensive experience in all the uses of open space as functional land uses to develop firm numerical standards. Even more, the variations of open space use make it difficult to do so. What is needed now is a constant application of the open space concept out of which can develop the ranges of open space use in quantitative terms.

Such standards as the “classical” standards, even more the guides of type, and direction of open space use as a control and factor in development will in time help establish more firm standards for all open space, as has been established for recreation.

In dealing with open space problems, there are three points in the land allocation process at which the existing standards and guides can be applied as a beginning.

The Planning Stage

The chief emphasis here is on the urban and urbanizing area. First is the relationship between open space and comprehensive planning. The point of departure

here is to examine the existing open space characteristics and to consider an open space system as the framework for the physical aspects of the comprehensive plan. The amount and location of land presently used for open space in the planning area can be measured and evaluated usefully in relation to the standards and guides now available. If, for example, request is made for public lands for school or recreation purposes, some evidence of the need can be made available in the measurement against standards for these uses. Even more questions can be raised whether the requests serve single or multiple purposes, that is, whether the guide suggestions for combined school-recreation facilities may be considered in the making of decisions of the lands in question.

Similarly, land requested for industrial purposes can be measured against the overall worker density figure as a beginning; even more questions may be raised about the desirability of industrial development in districts or industrial parks rather than on isolated tracts.

Thus, the first consideration would be to relate any of the open space uses in themselves or the proposal for other uses of open land for development purposes to the comprehensive plan of the area. The need for such a comprehensive plan becomes evident if there is to be a general bench mark for making the separate decisions. In working out such a comprehensive plan, the standards and guides now available can be used as they affect open space considerations.

Most difficult, in the planning phase, will be the development of attention to open space at the regional level in the western states. There seems to be so much land here that it is quite difficult to convince planners of the necessity of changing their thinking from the traditional search for "places to build." Yet it is here that the greatest opportunity lies; for, it is possible here in many places to reserve now those areas which should never be built on.

The planning phase is also the proper time to begin to develop a new sense of scale and linkage, especially in the western states where there is less to undo. It is only here, for instance, that open spaces on a continental scale can be reserved. The problems of the Great Plains, for example, may be attacked on a regional level—but only if there is an understanding that the characteristics of the area suggest entirely different urban forms than have been developed on the east or west coast.

In the planning stage, then, the emphasis would be on concept and would take the full scale range into account, from region to subdivision.

Review

The review function is a fundamental part of the planning process, the reviewing of a proposal more often than not made by others than the plan makers. To make a sound review of a proposal would require in part knowledge and understanding of the standards and guides used in making the plans. When such standards and guides are not present, the reviewer must perforce apply those in general use of those of his own that seem reasonable.

There are two kinds of review which can be made: the review of proposals which can be measured numerically or by adopted standards as in the case of school sites; and the review of proposals which are subject chiefly to judgement using guides of experience or example as well as purpose, as in planned unit development, where flexibility for future change is to be allowed.

In open space allocation under review, a first test will be in relation to a plan or scheme for overall development, a review of the uses of the open spaces involved, and an examination of *how a proposal carries out or expresses open space functions*. Where a development of open land is involved, the proposal can be reviewed in the light of the guides for open space in relation to development. If necessary, a proposer should be required to show that the proposed development use is of greater use value than the open space use in relation to a total development pattern. *So long as open space is in public ownership, the burden of proof should be on the use of land for other than open spaces purposes, to give full recognition to the basic tenet that open space has a functional use as such.*

Where new regulations are needed, it will probably be easiest to establish them in one of the newer forums, such as cluster. Those who review these development plans, therefore, will have need of guidelines such as those suggested.

Rigid standards may not always be suitable. The very point of the planned unit development, for example, is that it allows flexibility which has heretofore been denied the developer. The review function is thus extremely important. It seems at present that the most suitable aid to review commissions will be some "classic" standards coupled with case illustrations. There will be need of education, and the build-up of experience.

Existing and Potential Open Space Use

One of the most important activities in the develop-

ment of guides and standards for use by planners and review commissions will be a series of investigations into existing and potential open space use. Important strides have already been made in this by the State of Wisconsin where a detailed recreation resources inventory has been compiled. In addition, a detailed analysis has been prepared. This has led in Wisconsin to a program of recreation resource protection, development, and acquisition.

Open space inventories covering a whole range of open space uses and use combinations will be needed in each area of widely differing topography, geography, and amount of urbanization. A range of standards will thus be developed which will be of aid to actual programs. By constantly evaluating suggestions, eliminating useless and confusing information,

and incorporating helpful standards, there can be built up a valuable body of guides on open space.

Also needed is further information about regulations incorporating open space principles and experience gained with their administration.

The time to begin serious consideration of building a body of information is now when it can be of the greatest use. The suggested open space standards and guides should be regarded as truly beginning. Experimentation should be encouraged and latitude given in establishing guides for specific problems in specific areas. If too rigid an interpretation is placed on these initial suggestions, there may be too great a reliance on a minimum acceptable "standard" standard. There is room for the greatest range of ideas and indeed there must be testing at every level in every situation.

APPLICATION OF OPEN SPACE PLANNING

This section considers the interpretation and use of open space concepts in the comprehensive plan and in the management of open lands.

PUTTING OPEN SPACE PLANNING TO WORK

There are two major practical concerns for open space: one is the management of public lands; how to incorporate open space planning in traditional management practices. The second centers around the lands to be disposed: how to recognize when open space has been adequately included in the comprehensive plan and how to insure that attention will be paid to open space when there is no planning agency with jurisdiction to consider open space.

In the case of disposal of public lands the concern will be primarily one of understanding and evaluating

competition for open space versus non-open space. In the case of management, the competition will be among open space uses themselves. In either case the objective is to insure the proper preservation and use of open space. This process will involve the whole range of authorities, agencies, and developers.

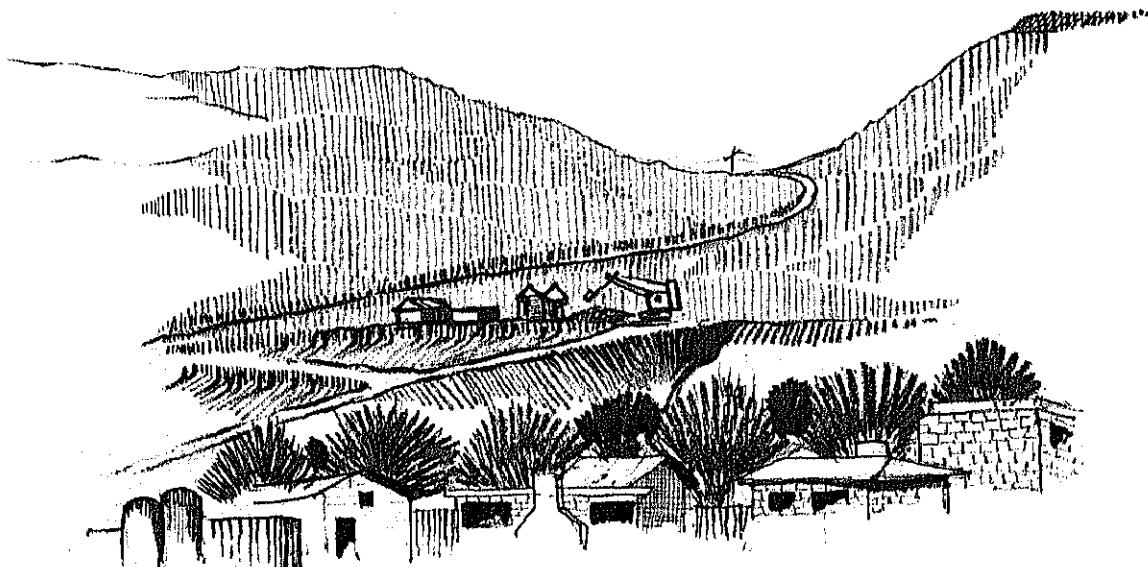
The Approach—Step by Step

Step I.—Determine the area of study and planning.

Mark out the area—a city and its surroundings, a county, a group of counties, state, region. Where applicable, make a first determination of sub-areas for closer study where needed early or later.

Step II.—The land exists—some in use, some not.

Map out the land in terms of its present and known use, working progressively from the larger to the smaller units that can be identified. Here, as at all stages of application, not all the information and



Mechanical scarring of the earth's surface threatens to destroy natural beauty of the area and leave unsightly blemishes instead.

data desired will be at hand. Some will be obtainable during the work—some will have to be introduced as new from field survey—but work with what you have and what is readily available to begin with, feeding in what can be obtained along the way and at the critical points. (It will seem that there is never enough information.)

Step III.—Make a first evaluation of committed lands in use, ownership and control—those in the public domain, those in state or other public ownership, private lands, lands under jurisdiction of flood control and other authorities. Use this step to establish the fixed elements such as National Parks, National Forests, State and municipal parks, etc. Include the spaces used or committed for highways.

Step IV.—Make a first evaluation of open space according to the classification of open spaces as utility, green spaces and corridor spaces. This may be a very rough or crude first classification. Take into account single and multiple purpose uses. At this stage there should develop a broad stroke portrayal of the open space uses in the planning area. There may be gaps in the picture where it is difficult to make a final determination of the best classification. This first picture may be far from complete and there will be many details to fill in.

Step V.—Make a first schematic of an open space system for the area. Mark out the significant areas of use, as anchor points of the system, and see what open space elements can be used to tie these areas together in a system of continuity—use the water courses, the highway rights-of-way and special topographic features. This becomes a first basic statement of an overall open space plan.

Step VI.—Take a more detailed look at the elements of this broadly sketched open space system, for a closer examination of uses of the open spaces themselves, trying to pin down as best as possible the borders or edges of the open space areas in the system. Review the classification of open space uses to work out a more definite designation of uses, both single and multi-use. See where the system is interrupted and make a determination of what changes should and could be brought about to make the system complete.

Step VII.—With a basic open space system at hand, check and compare with any plans which may have

been made by any other agency, federal, municipal, county, state or regional organization. Where appropriate, make suggestions for change to harmonize the system with such existing plans, either proposing changes in the plan or making adjustments in the system.

Step VIII.—Make a more detailed study of sub areas or parts of the planning area, with particular reference to development use, actual or proposed. This will be the point at which some basic determination can be made of the land most valuable for industrial, residential, public or other use. Of especial interest will be the areas designated in relation to the open space system as possible areas for development. The open space system is the framework of open space that will control and order development in relation to open space.

Step IX.—In conjunction with planning and other officials, work out open space planning problems in relation to these plans so that open spaces and open space planning are incorporated in these plans as a positive element. Work out with them suggestions and proposals for development patterns and assist as possible in getting regulations drawn up or revised to cover desirable patterns and procedures of development in relation to open space.

Step X.—Review and revise, detailing as possible the open space plans and related factors. Open space planning is a continuous process—not all the answers will be found at once and more and more detail will be needed and added. By taking the lead in open space determination and planning, and by assisting local authorities and local groups, a firm and workable open space plan can be developed for continuous use.

COMPREHENSIVE PLANNING AND PROCESSES

The Classification and Multiple Use Act directs that disposal of lands will be proper when such lands are needed "for urban and suburban purposes." The Public Sale Law permits sale of lands for such purposes if there are adequate local government comprehensive plans and adequate zoning regulations to insure proper use of the land.

On every level, proper comprehensive planning must underlie zoning regulations. Public lands in the Western states have large areas undeveloped or in

non-urban uses. Development planning in these cases may not be urban-oriented, but development of any kind involves decisions about open space. Particular attention to the planning process is necessary when development is related to urban uses or existing or potential pressures for urbanization.

An evaluation of the "proper utilization of open space" requires an understanding of (1) the nature of the comprehensive plan; (2) the design of the plan; (3) regulations; and (4) levels of application.

The Comprehensive Plan

Comprehensive planning is a continuous process—a series of logical steps—which leads to proposals for guided growth and development. A comprehensive plan is a framework of policy decisions which directs community action. There are three distinct phases in comprehensive planning:

Goals: What is wanted and needed?

Facts: What is the present position in relation to these goals?

Decisions: What changes can or should be made to achieve these goals?

GOALS—In this phase a sense of direction is established. The goals of a community are frequently generally understood; but they must be pinpointed and specifically stated in terms of the whole area to be planned. The area may be a community, a city, a region, a watershed, a special use area.

Goals are set for the general social, economic, and physical aspects of life within the planning area. These are general statements on which there can be widespread agreement. Representatives of all groups affected by the plan should be included in this phase.

FACTS—In this phase, detailed information about the past and the present is gathered and interpreted. These are used to give indications of future trends and activities, and to indicate what shortcomings or deficiencies may exist. The technical terms for this work are "survey and analysis." Data is collected about physical, social and economic factors which affect the future physical development of the area. Included are studies of population trends, economic activity, education levels, industrial growth, labor force, resources, major outside influences or regional development factors, and a host of other problems or assets which are suggested by the goals formed in Phase 1.

The result of this phase is an objective picture of

the present condition and position of the area. This picture is compared with the goals, and specific problems are identified. New goals may be brought to light during this time, superceding others previously established.

DECISIONS—In this phase, decisions are made about specific actions to take concerning land use, transportation, and public facilities—the three basic elements of the physical environment subject to planning decisions. The interlocking relationships among these elements and the importance of each to the whole community are carefully considered. It is this which makes the plan comprehensive.

The information of Phase 2 will have suggested more than one possible action in many cases. In this phase these alternatives are compared with the goals of Phase 1 and where a definite decision cannot be made, a firm direction is indicated. Factors of cost and timing of possible actions are considered, and a schedule is often made to pinpoint target dates and total expenditures necessary.

In practice, the process of developing a comprehensive plan is not neatly divided into these simple steps. There is almost always overlapping among the three, both forward and backward. Some of the more important goals may not emerge until the end of the process, and some of the decisions about what must be done are often clear from the start. It is this which makes comprehensive planning a continuous process—new factors appear, changes occur, goals of long-standing are accomplished, new goals are considered, new ways of achieving them are devised, existing rules and regulations are amended or supplanted by newer and more effective ones. A comprehensive plan is not something made once and carried out overnight. It is a guide to action and must be continually revised. The tools for carrying out specific decisions, such as the zoning ordinance and the capital improvement

creasingly there is a cooperative help and assistance from state planning agencies and federal agencies.

Special assistance on open space planning is in order in the public land states since the public lands may play a key role in the preparation—and carrying out—of a comprehensive plan. The assistance needed is of two kinds: one, general aid in the overall task of organizing for and preparing the comprehensive plan; and two, specific aid on the problems of open space. In such assistance, Bureau of Land Management personnel can be of key importance, among other things as experts and guides in open space planning. They are uniquely in position not only to encourage and assist generally, but they can make the most significant contribution in the make-up of the plan—to see to it that open space as such is a fundamental element of the land use plan, that an open space system is incorporated in the comprehensive plan as the structural base for the physical plan of development, and that open space concepts are introduced into the local development patterns.

The Design of the Plan

Planning has several dimensions: physical, economic, programmatic. It is not uncommon in present practice to let the economic factor take command, to obtain, or even require, an economic analysis—and market report—as the controlling basis for utilization of a site or area considered for development. This is particularly true for private development, but even public development sometimes uses the same approach.

Yet, there is another approach which is of long-standing in the history of planning. That is, how best to use the land in accord with its geographical nature and its potential as land within a larger context—a context which is increasingly urban. What is important to recognize is that several factors play significant roles in the planning of a site or area and full recognition should be given to what "ought" to be planned as well as to what market values will continue to be needed and used, but they do not represent all the values of development.

Some of these other values may seem to be new but they are, in fact, as old as the concept of "design" itself. They need restatement today in relation to site and development planning.

LIMITATIONS—The design of the plan will be made within definite limitations of geography, costs and purposes. The first task in design of the plan is to

establish and define the limitations. What is the planning area for which the plan is to be made; planning area the same for all problems? What are the time and cost limitations—is the planning done without reference to what costs will be involved and for what period is the plan being made? What is the plan to be used, applied, and carried out? Is the difference clear between the general nature of a comprehensive plan and the engineering of specific projects? What parts of the plan can be and need to be made in specific terms for early action? How can plans for such elements as open space be specifically designed in the plan so that they can perform their functions? A sound approach will be clear about the limitations upon which the plan is based.

FIXED AND FREE ELEMENTS—The initial task is to determine what elements are "fixed" and what are "free." These terms must be considered relative to the impact of costs, purposes, or other determinants, changes can be made to alter what at first be taken initially as fixed—water may be made to go uphill by pumping but only if there are other overriding considerations would this be a sensible thing to do. It is in the sorting out of the fixed elements and the understanding of elements that can be freely disposed in relation to the fixed elements that design is begun. A list of elements which would be considered "fixed" in an open space plan follows:

Fixed Elements

1. Areas which by nature are open space: water, steep topography, other unbuildable land.
2. Areas already designated as open space: National Parks, National Forests, Historic sites, wildlife refuges.
3. Areas not already designated, but which should be designated:
 - a. Recreation areas of all types
 - b. Areas considered for reserve (to be added to existing areas to create new open space areas)
 - c. Areas needed for flood control and drainage
 - d. Areas needed for utility purposes such as water supply, food, etc.
4. Corridor spaces already established.

Free Elements

These are the elements which are available to be considered for new or as yet undesignated use. In the open space approach these are the areas not included for open space uses, available for development. The characteristic of the free element is that it can be adjusted flexibly to the fixed element. This is particularly important in cluster and planned unit development where the open space and the open space system can be designed as the

fixed element and the areas left or designated for building can be designed in a number of ways including mixture of type and use. The open space as the fixed element is controlling, providing both space balance and site setting for the areas free to be developed.

THE IDEA, THE SCHEMATIC, AND THE PLAN—Given a clear statement and understanding of the limitations and the fixed and free elements to be incorporated, the process of design flows from an impelling idea to a schematic which ties together all and gives place to all, but still may allow flexibility and adaptation. Several major design trends at the schematic level are currently evident in planning:

- a. Peripheral access and landing, based on a plan of circumferential road and parking on the perimeter of the area, such as in a shopping center.
- b. Segregation of traffic, particularly pedestrian and vehicular. The pedestrian mall is a familiar example.
- c. Separation of services and levels, increasing use of underground tunnels for servicing buildings, trend to underground systems for power and other utility lines now overhead, and the use of crossovers, underground parking, and other grade separations in circulation of different kinds of traffic.
- d. Articulation of dimensions, street widths serving not only different capacities but different kinds of traffic. Most residential subdivisions streets today are wider than necessary.
- e. Protection of scenic values, consideration of new, identification and preservation of landmarks and natural formations as anchor points and space definers.
- f. Protection of the environment—the prevention and control of pollution of land and water.
- g. Systems development and design in the interdependence of urban and rural elements so that each element is enhanced in its functional uses, developed to its fullest potential, and protected in its unique characteristics. The concept of "systems, networks and regions" is aptly applied to those large areas of predominantly non-urban or rural use and character.

Out of the schematic may flow the plan, which while seemingly fixed or set, must then be susceptible to change in the course of time if necessary.

In site or development planning, then, open space would occur naturally, taking its place in the plan as part of other considerations—a creek bed to be left as a natural drainage way instead of a concrete ditch elsewhere, a rocky portion difficult to build upon, or a particularly fine stand of trees which might become center piece elements. Open space is not something to

be added at the end of the design process, but rather something which is the beginning of the scheme, a physical framework which is inherent in the characteristics of the site itself. In this respect, the design elements do not apply only to small scale development. On this principle, whole cities have been built, and many more today are being expanded.

Regulations

The comprehensive plan is supported by a series of regulations aimed at carrying out the provisions of the plan where private development is involved. Most often they are included in the documents making up the plan in maps and reports. Up to now, these regulations have been concerned only with private development and the exercise of governmental authority over it. There is real concern now about the application of the same rules and policies in decisions affecting public land—a concern pertinent to open space designation and use. The chief regulations affecting development are zoning, subdivisions control, and various building codes. They all are based on the public interest in health, safety, and the general welfare.

ZONING—Zoning is the regulation of use; bulk, size, and height and land coverage, and often of density. While the economic interest is not specified, the test of value is often involved and zoning issues may often be resolved in favor of the use with the greatest potential income or profit to private development. Open space of several types can be demonstrated in many circumstances to have economic advantages to adjacent property owners, yet may be bypassed in favor of immediate gain in actual practice. In Santa Clara County, California, for example, an exclusive agricultural zone was finally established, preventing the spread of development in this rich farm and orchard land. Surrounding development in suburban uses, however, may prove a strong enough economic magnet to raise the value of the farm land so that its owners come to favor a new change of zone to allow this kind of development.

Zoning provides for the division of a community or area into districts or zones, each of a distinctive land use with requirements of land and building development applied to each district. Zoning is provided for in an ordinance consisting of a map designating the zone districts and a text specifying which uses are permitted and which are not, defining the standards to be applied on each zone or use.

In its positive aspects, it protects the property owners' use against adverse uses by his neighbors. It can stabilize values and aid in orderly community growth.

From the early days of zoning, there has been a long struggle for acceptance. Zoning, it was held, was an attack on the cherished belief that it was a man's constitutional right to do with his property whatever he wished. Zoning, in effect, said otherwise: that a man could not build to cut light and air from his neighbor, that he could not build pigpens against his neighbor's home, that he could not so crowd his land that his neighbors would be made to suffer inconvenience, discomfort, or loss. It has, on the whole, come to be accepted as a necessary regulation of private property through the exercise of the police power and to keep order in community growth. Nowadays, lawyers rarely attack the constitutionality of zoning; more likely, they are inclined to plead that the regulations do not or should not apply to their client's property.

New concepts in zoning, such as cluster zoning or planned unit development, tend to allow greater variety of development types while still regulating the general characteristics of density and type of use. Greater freedom to use the natural features of the land and incorporate open space concepts is now possible in the layout of residential development and other large unit developments such as shopping centers and industrial parks. In actual practice, this freedom depends upon the review function of the agency which administers the zoning ordinance, rather than upon the specific rules and regulations contained within the usual zoning ordinance. For this purpose, a special zone district such as an RPC District (Residential Planned Community) or a separate ordinance for cluster or planned unit development may be enacted.

SUBDIVISION CONTROL—The regulation of land subdivision for residential and other uses is widely accepted as a function of municipal and county government. It is accepted as a method of insuring sound community growth and providing a framework for sound investment. Subdivision regulations control in greater or less degree the following features: the actual sub-dividing of the land into lots for sale including location and size of storm and sanitary sewers; the location and design of streets in the area; densities and shapes and sizes of lots in relationship to existing zoning controls and/or utilities to be provided by other than the subdivider; dedication or reservation of public sites for schools, parks; location and design

of sidewalks and gutters, crosswalks and street signs. In short, controls are provided over both layout and improvements. The better regulations also seek to suggest good design practices in the use of the natural features of the land and planting of streets trees as well as general layout. Some regulations allow the imposition of further regulations concerning appearance of structures and other covenants which attach to the property for a period of years.

OTHER TYPES OF REGULATION—There are a series of codes—mostly concerned with building and occupancy—that are also among the tools of implementation of planning. These may be building, fire, plumbing, electrical or housing codes.

The by-laws or ordinances of many cities and towns include specific regulations for several activities which affect the land and its natural features. Removal of top-soil or digging for fill or gravel is frequently strictly regulated even in small towns. Some places restrict the cutting of trees within the town boundary. Some smaller incorporated areas have been able to enforce successfully ordinances which prohibit overhead wires altogether, while others merely banish the wires to the alley or utilities easement. The celebrated case of Woodside, California, versus the Atomic Energy Commission and the Congress of the United States illustrates, however, that there is still a monumental gap in our understanding of the propriety of regulations which preserve the land and its natural features and prevent destructive development.

The concern over the provision of open space has prompted the development of a number of new tools: special conservancy districts, open space dedications, open space easement, development rights compensation, compensable regulations, reservation in advance of acquisition, tax concessions, the guaranteed value scheme, the official map principle. All these have been suggested in various terms, and are the subject of increasing attention and in some cases of legislative action.

ADMINISTRATION OF THE REGULATIONS—Acceptance and support of zoning, subdivision regulations, and other regulatory measures rest on the principle of reasonableness. If the measures themselves and their application appear to be reasonable, they can be exercised as the proper use of government police power to regulate actions and enjoyment of property.

The principle of reasonableness is based on, among other things, the uniformity and consistency of this exercise of police power. People are more likely to

accept regulation if there is feeling and knowledge that similar situations are treated alike and that the same rules apply to all. Such uniformity of application is directly expressed in the establishment of districts or zones within which the same measures and measurements apply. Uniformity and consistency are expected particularly in the items which can be clearly measured and identified, such as distances, densities, types and specific arrangements. Thus, regulatory measures all seek to be specific in terms of numbers and amounts and thus insure or make possible uniformity of application.

Problems often arise from the attempt to deal in a uniform and regular way with circumstances which are not uniform and cannot be made to comply with standards of uniformity. The vast variation of details and the inevitable variations that reside in land and needs, particularly now under the impact of many kinds of changes, make it wise to allow for the non-unusual circumstance. Within the regulations themselves, there should be provision for variations, adjustments, hardship cases; and the regulations themselves should be subject to review, revisions, and restatement to be kept up to date.

It is well to take note of the critical problems which arise over jurisdiction, particularly with regard to the regulation of one public body by another. Three kinds of jurisdictional problems are of concern:

1. Regulation of public uses within the locality;
2. Regulation of state and federal uses;
3. Regulation of other jurisdictions—public, quasi-public, and para-public.

A great issue is whether private property can be regulated without applying the same conditions to public uses. The argument is that private property is regulated for the public benefit, and that public use is already committed to the public benefit. Yet this argument may in large part be based on zoning and enforcement codes as being negative, restrictive, penalizing, rather than permissive, positive, and confirming rights.

It is possible that in certain circumstances, the rights and permission conveyed by the regulation may be disaffected or denied by creating conditions in public use contrary to those laid out as land policy in private use. Thus, the use of a park by an expressway may be considered as a loss to private property abutting the park, developed or held because the park already existed as a public use.

There are more questions of jurisdiction, but it would be important to our understanding to put all in a positive context so that overall land policy is

recognized both in public and private uses. In this context a new approach may be found in the use of open space as a planning control for both public and private development of land.

Where Open Space Planning Can Be Applied

The open space approach can be used effectively at all levels of area planning: site planning, community and city planning, the metropolitan area and the region. The method is to lay out first a system of open spaces and then relate development needs and possibilities to this open space system.

SITE PLANNING—The site is the smallest unit of development, from that for a single building to a complex of structures, such as a campus or industrial district.

On a site for a single building, first consideration should be given to how much of the land be left unbuilt on. Even in New York's Manhattan, where building intensity is of the highest order, there is concern for ground space left open and major buildings have been designed with setbacks or open areas, to compensate among other things, for greater height. In a simple case of a residential lot, setbacks or yard requirements are a usual starting point for location and fitting in of building—the open space approach is familiar and common in this case.

The problem appears more complex for a group of structures, but the basic concept and method applies. In campus planning, for example, the most successful approach is the determination first of the system of open spaces—the organization of open spaces that determine and control the entire scheme, taking into account the matter of perimeter access and feeding roads, parking and other landing spaces, edges (for definition and buffer), open spaces as center pieces around which buildings can cluster, the whole system of center pieces and separators tied together with distributor open spaces for both pedestrian and vehicular access, circulation and service.

In site planning as in larger scale situations, the open space approach leaves maximum freedom for design and flexibility in meeting building needs for the future.

In some cases the amount of land to be left open and that available for building can be set as a limitation in per cent of coverage or in specific dimensions. These limitations need not be considered restrictive but rather as the *open space requirements, as the prior*

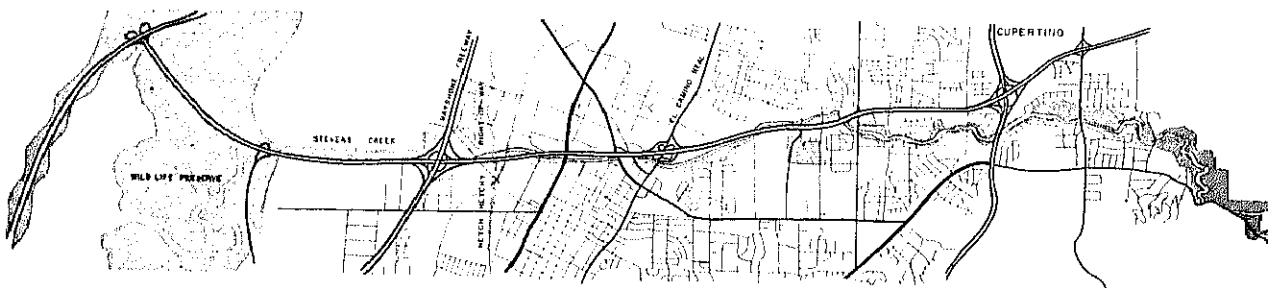


FIGURE 13—*Greek As Unifying Element Of An Open Space System—Santa Clara County*²¹

conditions for development, and they set the conditions for the development possibilities and ingenious building solutions.

THE NEIGHBORHOOD COMMUNITY SCALE—In planning a neighborhood or community area, the key determinants will be the nature of focal open spaces—for example, school and recreation areas, shopping centers—edges and definitions whether of major corridor routes or other green area separators; and the pattern of streets linking the whole together. Here again, the system of open spaces should be laid out as the basic framework, with more intimate scale involved. The natural forms of terrain should be first determined to provide utility open spaces for drainage, utility lines, etc., and green space functions and to give a continuity of open spaces for the area, linking perimeter or edge with centerpiece spaces through the street system.

The cluster and planned unit development patterns were particularly applicable to planning at the neighborhood and community scale. As noted sometimes these are worked out as a series of "villages" bound together and unified by the planned open space system.

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THE URBAN COMPLEX AND METROPOLITAN AREA—There may not seem much opportunity to introduce a complete open space system in heavily or even moderately built-up areas. Yet a number of communities are attempting this in some form. The essen-

²¹ "The Common Green" brochure, op. cit.

tial idea is to develop linkages through existing or possible elements such as creek and other waterways, public parks and secondary open space areas such as schools, cemeteries and the like, highway systems and often some land bypassed in development for one reason or another. The important part is not so much the size of the linkage elements but the continuity they may provide.

In the outskirts of the more heavily built-up urban area, in the metropolitan area itself, there is greater opportunity now to establish an open space system before haphazard development has taken over. The same devices or elements are available, often at larger scale and other open space uses may also be available in farmland and public holdings or land under public control for flood and other purposes.

The problem is partly one of education and a direct "selling" of the idea that the open space approach is of benefit not only to the public interest generally, but to local government, to land owners and to developers. Education may have to be spiced with incentives such as direct help in making suggested plans, willingness to dispose of public lands on the basis of concurrence with open space plans, special tax incentives, the use of scenic and other easements, the compensation and the application of flexible approaches in planning and development in cluster and planned unit development.

Negotiation in relation to an open space plan is better than arbitrary requirement of developers to assign a percentage of development to open space. In most cases, the developers can be shown that it is to their advantage, land that may be dedicated to open space uses often is the least desirable and most costly to build and there is increasing interest in the public power to be exercised—for example, in zoning wetlands, flood plains and water courses against development—and in the use of financial and regulatory aids in assembling land for proper development

in relation to open space. True, in the final test, public ownership is vital and may be the decisive factor in creating and preserving open space in metropolitan growth.

There are some famous examples of metropolitan area open space systems. The "Emerald Necklace" of the Cleveland Metropolitan Area based on a "park road stringing zoning beads of regional reservations, in part wild and in part developed for recreation" has also river valleys incorporated, and eventually the reclamation of the Lake Erie shore

Washington, D. C. has an extensive system incorporating streams, valleys and parkways and large institutional uses. (See Figure 17)

Gifts and donations, private and federal government, have been used in the past and also provide today a positive means of establishing the open space network, but it is important to emphasize that such donations and gifts have and should have restrictions riding with the land for permanent retention for open space uses.

The opportunity for effective open space planning is particularly great at the scale of the county or a group of counties where local jurisdiction can be exercised along with help of the federal and state agencies, and where the Bureau of Land Management is pointedly involved as the largest holder and manager of open space. This opportunity extends to the larger area with urban impact, in the metropolitan areas themselves, and the Bureau program can be particularly effective in harmonizing the problems of multiple jurisdictions.

The Regional Scale—The concept and application of open space planning applies to regional development with particular concern to relation to the growth of the great urban regions. The problem of scale raises problems not only of vast sizes of territory to deal with, but problems of multiple jurisdictions—local, state and other federal agencies.

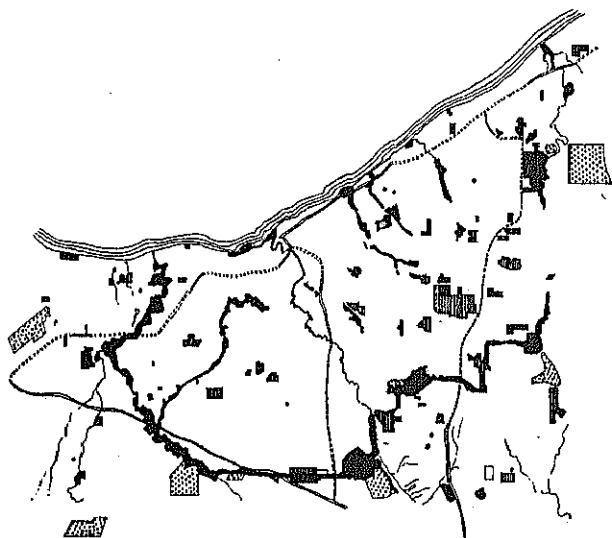


FIGURE 16—"Emerald Necklace" Open Space System of Cleveland, Ohio—A park road joining "beads" of recreation and scenic areas.^{21a}

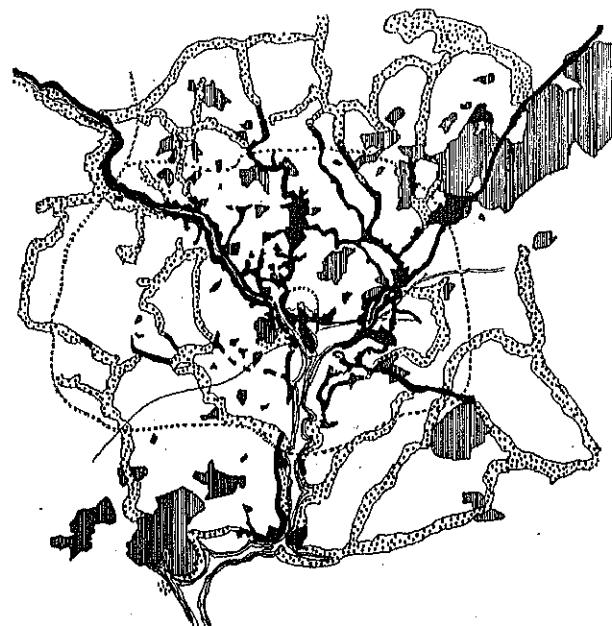


FIGURE 17—Open Space System of Washington, D. C.—Parkways, streams and institutional open areas interwoven.^{21b}

systems. The key is still the organization of the open space functions, ultimately to be scaled down to the urban areas and localities.

The jurisdictional problem must be faced—the regional planning body is on the whole missing, although states are increasingly tending to deal with their planning problems on a regional basis and in a few cases have recognized the problems of interstate planning. More often than not, particular regional and interstate problems are dealt with on the basis of a single purpose agency—river development authorities and the like. The TVA example has not been applied generally.

Yet there are great opportunities in the Western States where perhaps concepts of regional development are more widely accepted than in the East. County and state boundaries may be inadequate for comprehensive regional planning purposes, even though a particular situation may be particularly defined in these boundaries. In regional planning in the West, BLM has a significant role to play and can make a significant contribution particularly in regional open space planning. It can encourage regional planning conferences, at the least participate fully in the regional planning program concerned especially with open space planning.

A major concern will still revolve around urbanization within a region with attention in two directions: one, the planning and provision of open space systems related to the urban areas of the region; second, the program of land exploitation, waste, pollution, despoilation and encroachment, applied to cities as well as rural areas. BLM can play a powerful role in the problems of greenbelt and similar open space use at a large scale and in the provision of linkages and continuity in the open space sub-systems that can be worked out within a regional system. It can be especially helpful in the leadership for new development patterns in which open space is the vital force.

IMPLEMENTING THE OPEN SPACE PROGRAM

No matter how important open space is in concept and need, its virtue rests on carrying out an open space program. Two ingredients are necessary—an open space plan and the tools for effectuating it.

Where There Is No Present Planning Agency Planning Program

Get one started. Carrying out a plan will require local government action. Help bring together the interested officials and leaders and help them see the necessity of the planning job and the advantages of the planning process. Help, both technical and financial, is available from several sources, the State, universities, other federal agencies. The National Association of County Officials has County Planning and Zoning Action Guides. Professional help can be sought from private professionals. Offer what direct help possible in information, participation and guidance for obtaining assistance from the other available services.

The most useful contribution is by way of example. Make at least a preliminary open space plan no matter how crude or incomplete—show how it can help or needs to be helped by local planning. Aid as much as possible in opening up the view, not only in open space problems, but in the need of approaching the planning and doing on a larger scale where necessary, in bi-county, multi-county or regional approaches.

Most important of all, be the expert on open space in all respects, its functions, its use in comprehensive planning, its role in development, and the tools, existing and new, needed to make an open space program effective.

Where There Is a Planning Program

This is, of course, a head start. First, get to know all possible about the program, how it has been organized, what standards and concepts have been used in making it, how it is being used, and how the plans have been or are being carried out. Make a review of the planning done and the plans prepared especially to see what attention has been given to open spaces as such and open space planning. Make an analysis of the local situation in terms of background problems and experiences, leadership, procedures in planning and their application. Work out a procedure for the involvement of local people, particularly in open space planning. In some cases it will be best to have some kind of open space plan prepared or in preparation, whether as a sketch or more fully developed, to work from and to focus attention on open space planning and to have something specific for the local people to work with. It

some situations, however, the presentation of an already prepared plan may not encourage the involvement or participation of local people, and may even offend them as something already set. As a general rule, it is well to get local people to participate in open space planning in its early stages leading up to an open space plan in which they have an investment in and a commitment to its preparation. That program of local participation is best in which the local people are working with you not for you—or against you.

Where open space has not been incorporated as a functional element, make suggestions about revisions and studies of the plan toward the development of an open space system. Here again, example is the most useful and effective contribution, the example of the local possibilities as may have been worked out by you, examples from elsewhere. Bring in what expert and professional help you are able from within the agency or from outside to reinforce your own work.

Check on what tools are presently available, such as zoning and other controls, and what programs or acquisition are in force, are being considered, or are possible. Be free to introduce newer concepts in development patterns such as cluster development (You may be surprised at the growing acceptance of some newer ideas, especially since you represent a possible means of putting them into practice).

Help provide additional information. You have information of your own on land status and other data on land and open space of central importance in local planning, and what you don't have, you may be able to help get through State and Federal channels. Work for a data information system that will not only provide information for the moment but that can be kept up to date. What happens to disposed land is of crucial importance for further and future decisions.

Pass along your problems and experience, up and down. An answer may be found in somebody else's experience and yours may give somebody else an answer.

Above all, recognize the importance of open space and open space planning as a crucial force in the work at hand, and your role in meeting a most significant element in land planning and management, and in guiding growth and development on the highest plane of the public interest.

Specifically, have in mind three important problems:

1. Establishment of permanent open space, the open space needed for production, for control of development, for the future needs.

2. Use of open space in better urban development, in the newer patterns of cluster development, planned unit development for commercial, industrial and mixed uses, and the provision of public spaces needed now and in the future.

3. Development of an open space system as the base of land uses, preserving natural features and resources, eliminating waste and pollution, and opening up development on a sound basis.

IMPLEMENTATION TOOLS

There are old tools still useful, as is or sharpened, and new ones that have to be brought into the work. These tools are brought into play through legislative, federal programs, and local support. *The most important tool at hand is the holding of land and the policies and practices applied in disposing or managing the land.*

The Regulatory Tools of Zoning—Zoning is now considered in some quarters a weak tool, especially for permanent open space preservation. Yet it can be helpful and is available under state enabling legislation. It is still a basic tool and should be part of the kit. In the undeveloped areas of the West especially, open space zoning can be developed into a workable and acceptable tool. Principles have been established in flood plain, agricultural zoning which could be extended to other natural resource zoning as wetlands, forest cover, riparian lands, aquifers, rare ecological or geographical areas, etc. Legislation at state level may be required in most states to broaden zoning to these kinds of lands and uses. It would be best if the principles could be developed for the county and regional level in the Western states giving powers for regulation which relate to the natural condition of the land.

Zoning is a regulation primarily of the use of private property and may entail compensation if traditionally held rights are infringed. Compensation may not be rigidly limited to money, but may also include compensatory rights and compensating community values.

There is now proposed a development ordinance which would include all development regulations of zoning, subdivision control, and possibly building and other development codes. This may tend to rationalize administration of regulations. It would still need to give place to open space uses and might be the means to provide a regulatory basis for an over-all open space system.

There is also the suggestion to grant zoning power to State and regional agencies to establish broad land use classes or to control areawide resources.

Acquisition—The traditional alternative to regulation is outright acquisition, either through purchase by the public or through donations by private individuals or groups.

Acquisition by the governmental agency normally requires funds, and a sound financial program in any locality would include a proportion of public funds to be programmed for continuous acquisition of land needed for public purposes in relation to the comprehensive plan. Advance acquisition of land is not a general practice but is a necessity, and some financial assistance is provided through the federal program for such purposes. There are, however, some difficulties in this approach: one, the lack of funds and the reluctance to assign funds for this purpose in the face of a number of other pressing demands. There is a concern, too, for taking land off the tax rolls and thus diminishing the return to the public treasury, but it is a question whether in total impact this need be so—much depends on assessment policies on land whose value may be enhanced by an open space program. Also, some revenue may be forthcoming in the use of public spaces thus acquired by user's fees and leases and concessions in relation to open space uses.

Open space land may be acquired by acquisition of tax-delinquent land, and in cases where such land may not be part of the open space system traded for land that is. There may also be limited purposes acquisition such as acquiring scenic easements for highways through excess condemnation and the acquisition of access rights to open spaces. Multi-purpose acquisition programs by states seem to be increasing, for acquiring and developing open space lands and for assisting local communities in such programs, as well as pollution abatement, preservation of flood plains, etc.

Acquisition through private donation is often overlooked. Such donation may be made by private individuals or groups simply to preserve the beauty and public interest in a piece of land, or may be made by developers in connection with their development programs.

What is important in acquisition, whether public purchase or private donation, is the insurance of permanency of open space use, accordingly restrictive covenants riding with the land are essential.

Easement, Leases, and Licenses—Easements are most generally used for the purpose of preserving open space. They may be of two kinds: one giving the public rights to use the land, and the other limiting the uses of land by the owners. Scenic easements,

conservation easements, are among the purposes. Use rights may also be obtained by special use permits and license agreements.

In all these cases, as in the purchase of development rights, compensation is involved. Permanency of open space use is not necessarily guaranteed since at the end of the easement, lease or license period, the land could possibly be put to other use.

Tax Policies—A number of proposals have been made and some put in effect in using taxation as a tool. This may be in preferential assessment as in the case of farmland, or tax deferral providing tax relief intended to encourage owners to maintain open spaces, and in some cases, tax exemption for forest preserves, nature preserves, or open spaces privately owned but available for public use. Tax policies as a means of compensation for open space preservation and open space use may be given increasing attention.

State and Federal Programs and Aids—State involvement is of two kinds, the direct programs of state acquisition, control and local assistance; and state legislation establishing State government policies in open space, ranging from constitutional provisions, legislative action permitting local government to perform, and specific legislative actions in particular instances. State programs may include bond issues for acquisition, stream, valley and other zoning, roadside scenery protection, state development commission programs, acquisition of easements, and state tax policies.

The Federal role is extensive in assistance for planning, acquisition, survey and data collective operations, open space development and improvement, conservation and research, and land management. The Federal role is both direct and through assistance to States and localities. It also includes tax policy in the reduction of estate tax for donations of land and allowance made in income tax.

Private Groups and Associations—Private groups have long been interested in conservation and preservation and their aid can represent an important part of the means of implementation of an open space program. The Conservation Foundation, Nature Conservancy, Izaak Walton League, Sportmen's groups, Sierra Club and others are found on the national, regional, state and local levels.

Development Schemes—The development of an area may be the means of providing open space as part of the open space system. In this case, cluster and

planned unit developments of all kinds offer ways to implement the planning of an open space system.

To make proper use of this tool, however, the open space plan must be developed in order that assignment of open space through development programs mesh with the overall and desired open space arrangements and uses. Development programs can be particularly useful in providing linkages and fill-ins for the open space system to carry out plans for several elements, such as greenbelts and distributors.

The Public Holding—Perhaps the most effective tool at the present in the Western states is the federal obligation in the classification, disposal and management of the public lands.

Open space is both an objective and a means and the public domain is the most vital element present in the Western lands to provide for the needed open spaces of the future, as well as guide and control growth and development in the public interest.

OPEN SPACE AND LAND MANAGEMENT

Lands which are classified for retention will be of open character to begin with. How this character can be maintained, and in some cases become a dominant value, will depend upon incorporating open space concepts in the traditional management practices. The relationship of retained lands to surrounding development will be a key point in carrying out management directives; and cooperation of and with other agencies, local, state and federal, will be most pertinent.

The Public Domain

The Classification and Multiple Use Act sets forth as the policy of Congress that the public lands shall be "retained and managed or disposed of, all in a manner to provide the maximum benefit for the general public." This means that some of the land administered by BLM may remain in public ownership. The Act directs that criteria for deciding which lands are to be disposed of and which retained shall be developed by the Secretary of the Interior who shall then apply the criteria and classify the lands.

An inventory of the public lands has been completed to identify four general categories—three of which can be considered potentially for retention and continued public ownership and management:

- a. Large areas of public land which are relatively easy to designate by boundary, called "best-blocked" lands by BLM. About 70 to 80 per cent of the public lands are so described, and probably will remain in public ownership for multiple use management.
- b. Fragmented land areas which are highly valuable for some uses, such as recreation, and which may lend themselves to public management to retain their value.
- c. Specialized areas such as game ranges, wildlife refuges and key recreation areas.

The general directive for optimum multiple-use management of retained lands considers chiefly four points:

1. Existing or future demand for the resource use, value or commodity
2. Coordination and cooperation with other agencies and land owners
3. Consistency with national programs
4. Compatibility of possible uses

Open space as a positive land use is clearly within the scope of these directives. In fact, the rapid disappearance of open space is manifest by concern on every hand. The open space concept itself is a concept of multiple-use: open space functions as resource, green breathing space, or corridor the multiple-use objectives are directly related to open space values: fish and wildlife development, mineral production, outdoor recreation, timber production, watershed protection, wilderness preservation, preservation of public values. "Proper utilization of open space" is a specific criteria for retention. The case for open space in land management is clear.

The Criteria of Open Space Classification in Land Management

1. *Open space is a resource to be protected and conserved, used and managed like any other resource.*

2. *Open space can be classified and designated for open space functional uses, in the broad classifications of utility, green and corridor spaces. More detailed classification can be made in terms of resource and reserve use, land performing certain work, such as flood control and drainage, land for "public use," such as parks and recreation, land for growth and control of urban development, and land used for passage and movement.*

3. *Open spaces serve multiple purposes and are to be considered in the way they can be put to multi-use; in specific open space uses and in relation to non-open space uses.*

4. *Open spaces must be developed in a system of open space in which linkage and continuity are of vital importance. Priority of use may be determined in relation to the open space system.*

5. *Location, size and density of use of open spaces must be related to comprehensive planning whether at the regional, metropolitan or community scale.* Open space as such must be developed as a fundamental element in comprehensive planning, coordinate with non-open space uses.

6. *Open space should be considered in function as a framework for development in determining its use, retention or disposal.*

7. *Open space under public ownership or control should be considered in relation to open space privately held as part of a total open space plan. The total open space system may be a composite of public and private land used for open space purposes.*

8. *Open space should have the character of permanency for open space use.*

These criteria apply to proposals to release land for development or public uses and in decisions to retain land for multiple-use management.

State, Regional, and Metropolitan Programs

Essentially the same criteria apply at levels other than the national, for the same public purpose and interests holds, and the nature of the problems are repeated at other levels of jurisdiction. All governments hold, own and control land directly used or potentially useable for open space purposes. The variations of state and local policy can be strongly influenced by national policy, program and administration. New legislation and especially new organization for planning and management at the regional scale is needed. Application of open space planning and use may bring to light other needs, too, but even with present limitations, open space planning can be put to work.

THE OPEN SPACE PROGRAM

Ideas and concepts seemingly obvious sometimes

need statement to put them to use. Open space, no matter in what terms it has been identified, is not new. What is new is the acceptance of open space as a functional land use, as a basic element in planning, and as a classification of land use in land disposition and management.

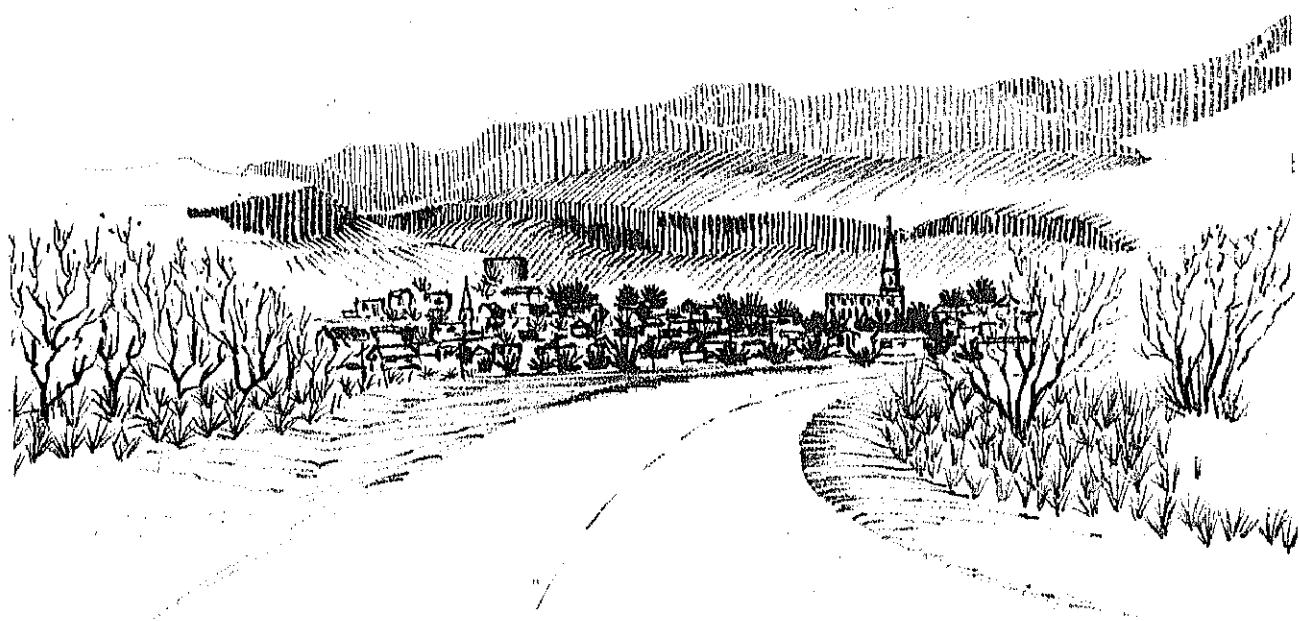
The most critical problems of open space seem to be in relation to urbanization. Urban development has eaten into lands which may be best in open space rather than building use. And the urban expansion is now pushing into lands which until recently were thought to be non-urban affected. The emphasis on open space, while it is a pervasive program affecting the whole of the land, is therefore at this moment in the control of urban growth and expansion.

The open space program accepts open space as a positive use, doing positive work. It is a fundamental element in comprehensive planning. It requires the working out and establishment of open space systems and open space plans based on those systems as a prerequisite to development planning. It involves the expenditure of funds, largely public, to acquire and hold land for open space purposes and it requires that land now held for open space use be left for open space use. It will call for new legislation, a new planning and development organization, new versions of public action, regulation and management.

Land should no longer be considered as open space simply because it is unused or undeveloped. Land as open space will have specific use designations put to it. Nor will it be a matter of scattered, occasional pieces of land large or small, but rather part of a system of land use performing definite functions, now single, now multiple—most often multiple—as spaces used by people for a great variety of purposes not involving building and at the same time conditioning, ordering and making more useful and valuable those spaces involving building. The open space program is a program of land to be managed and a program of land for management of all land.

PART II

THE WASHINGTON COUNTY CASE STUDY



St. George is a natural stop off for persons traveling between urban centers which the interstate highway system connects.

VERIFICATION

Does the Washington County, Utah, Case Study support the validity of the open space concepts and land classification system proposed in Part I of this research study?

The Washington County Case Study was undertaken to provide at least partial verification of this question. The open space concepts and land classification system were applied to the Utah county. Findings were then analyzed to determine their potential usefulness in assignment of land use for open space planning.

In addition, open space planning concepts were evaluated regarding their usefulness to field personnel faced with decisions on assignment of land use.

Phases of the Study

The case study of Washington County is presented in three parts:

1. *Application* of the open space concepts and land classification system to Washington County using available data.
2. *Identification* of the process of data collection including the kinds of data needed and its availability.
3. *Evaluation* of the potential usefulness of open space planning to field personnel.

APPLICATION OF THE OPEN SPACE CONCEPTS TO WASHINGTON COUNTY, UTAH

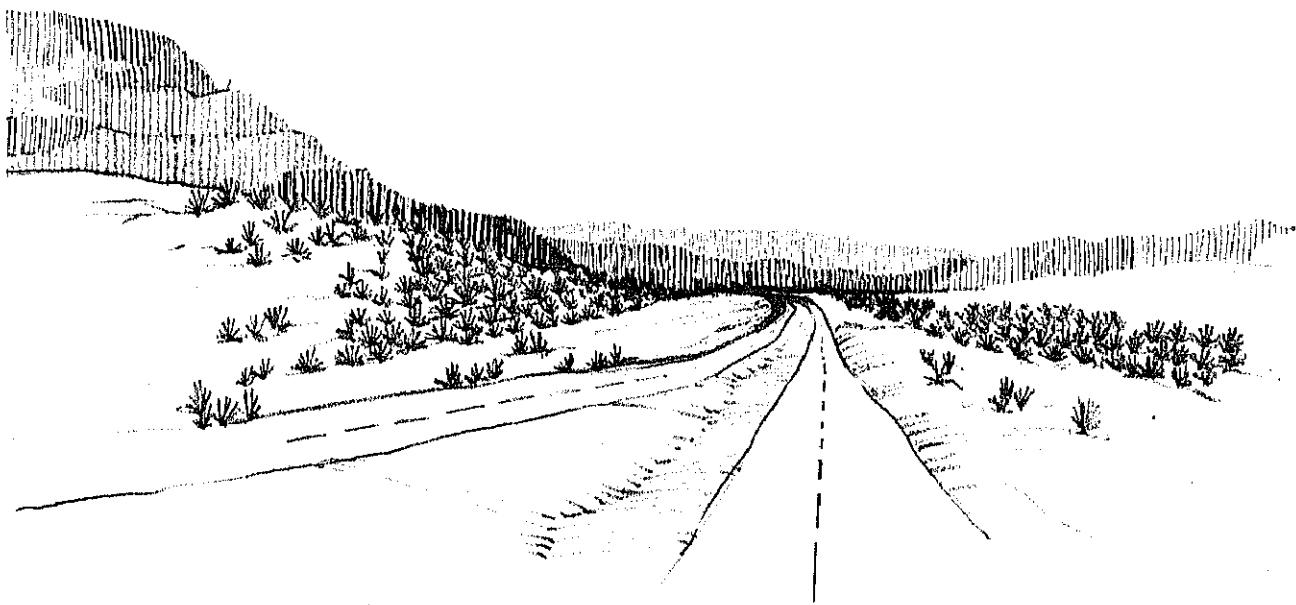
The open space concepts and classification system of Green, Corridor and Utility Open Spaces identified in Part I of this study were applied to Washington County using common planning techniques. Proper comprehensive planning technique necessitated a careful review of the physiographic, demographic and land use and ownership patterns of the county prior to application of concepts.²² A varied range of needed data and fragmented sources resulted in large proportion of total effort to this phase. As might be expected, once a complete overview of the study area was prepared, application of open space classifications and concepts was readily done.

²² Supporting statistical and graphic material which provided a basis for application of open space concepts to Washington County are included in an appendix at the end of this study.

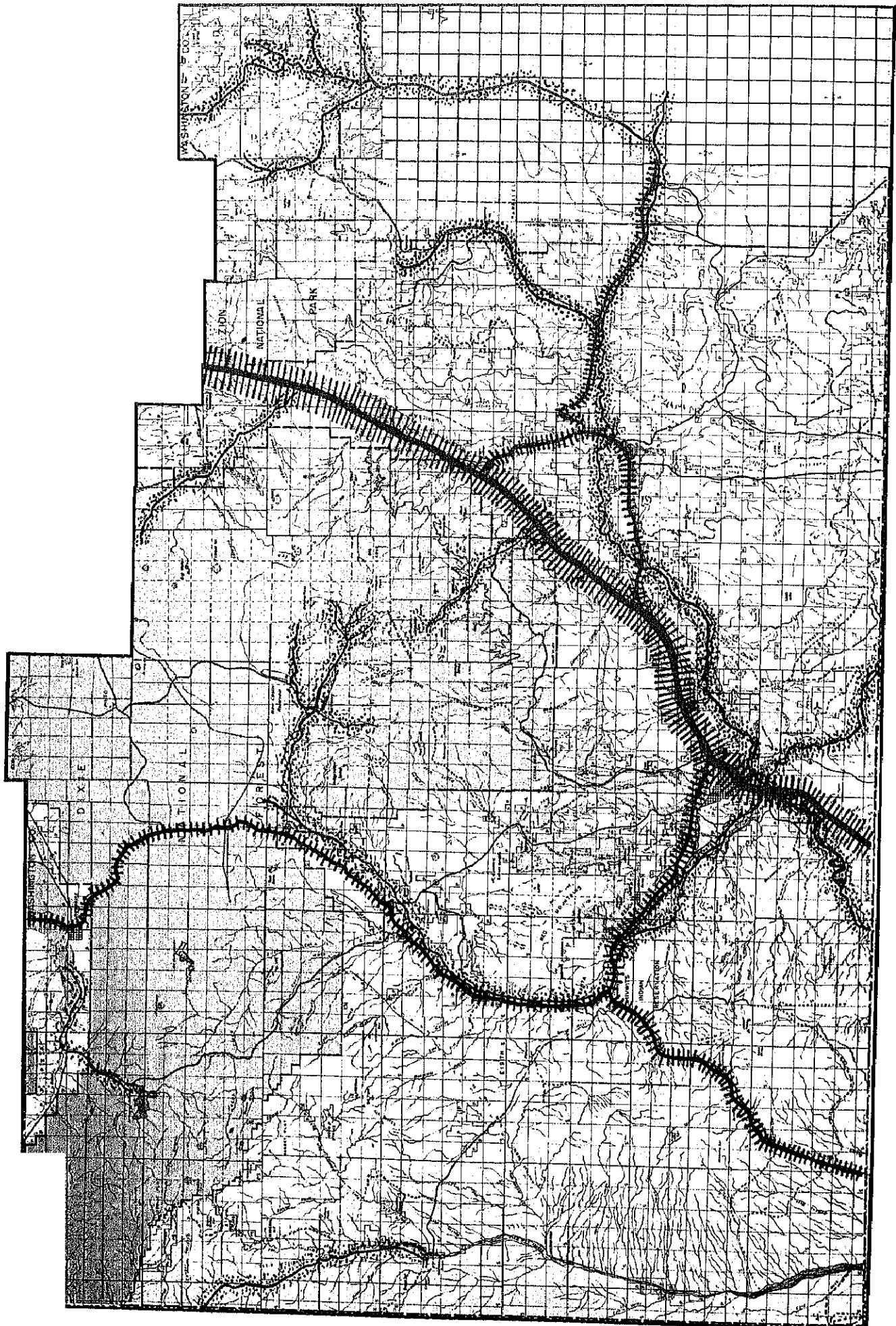
THE FRAMEWORK

Open space is seen as a framework in which lands are categorized according to appropriate, general open space classifications. Into this general, almost schematic, framework more specific open space classifications are related. A hierarchy of scales is thereby established leading from the general to the specific. The land classification by open space standards, then, is a process of successive refinements which can provide guide lines to assignment of land use ranging from large, general areas to specific, small tracts.

The open space framework for an area is largely determined by



Through thoughtful planning, corridor open spaces can become natural rather than forced elements in the total environment.

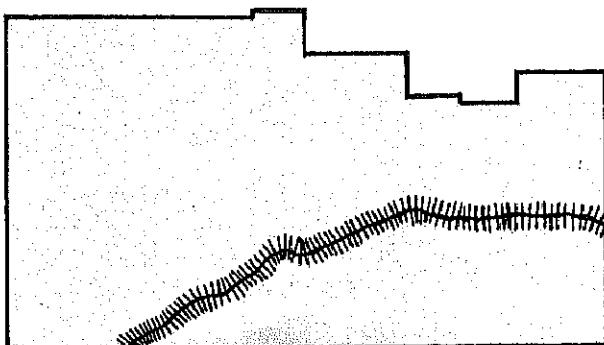


OPEN SPACE FRAMEWORK
GREEN OPEN SPACE

1. natural elements such as water courses and mountain ranges and

2. man-made elements such as major highways and previously established communities or developed areas.

For Washington County, Utah, the open space framework was determined by a river, mountain ranges, primary highways, and a national park. Figure 20 shows the basic Washington County Open Space Framework.



Virgin River

FIXED AND FREE ELEMENTS

Some natural and man-made elements of any study area are by their very nature inflexible, that is, *fixed*. As implied by their descriptive adjectives, *fixed* elements have a set position and are inflexible in planning arrangement.

An example in Washington County of a *fixed* element is the Virgin River, a water course.

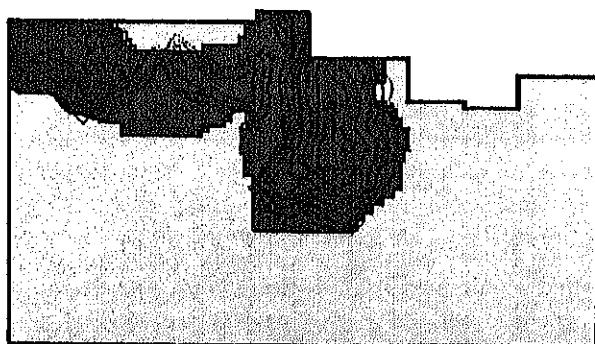
Other elements, both natural and man-made, often will be less precisely positioned, this is, *free*. Those elements which we call free can be positioned at least partially, if not totally with some freedom, that is *freely*. Thus, *free* open space elements can be used to strengthen and complement fixed elements in establishing an open space framework.

An example in Washington County of a free element is the boundary which defines the precise lands of water sheds. Although drainage areas are distinct, water shed designations do not necessarily represent the precise drainage surfaces; for these are sometimes legislative assignments.

The distinction between fixed and free elements permits their separate treatment in development of an open space framework. Both of the examples given are classified as open space and both contribute to establishing an open space framework in the study area.

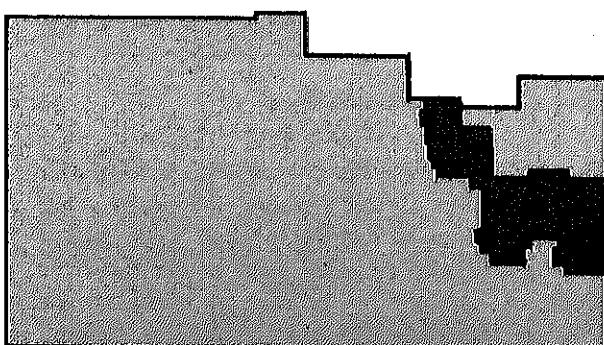
*Virgin River*²³—This strong plan element provides a primary open space for the framework. Development of communities and other activities along the water course evidence its importance as an integrating element. Clearly, this is a *corridor type open space*.

Dixie National Forest—This mountainous area was early protected from development by its designation as a national forest. Although the boundaries of the



Dixie National Forest

forest lands are, in fact, not nearly as sharply evident as depicted in maps, the commanding place of the mountain range in Washington County is recognized as an essential element to be protected as open space. This land could be classified as *green open space* or *utility open space*, or both, but utility is more likely representative of actual functional uses.

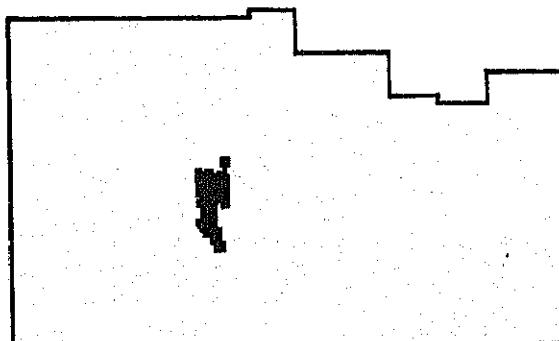


Zion National Park

Zion National Park—Scenic lands are a primary asset of Southern Utah. Protection of these kinds of lands

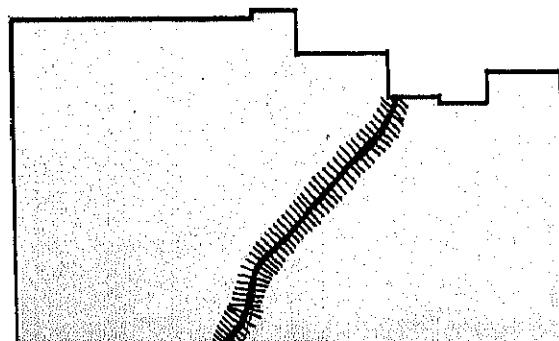
* Sketches are illustrations only and may not be complete or properly scaled.

is essential for the recreation of future populations of the state and nation. While not the only scenic area in the county, Zion National Park has been legislatively protected as an open space. It forms a basic element in the open space framework. Classification is as a *green open space*.



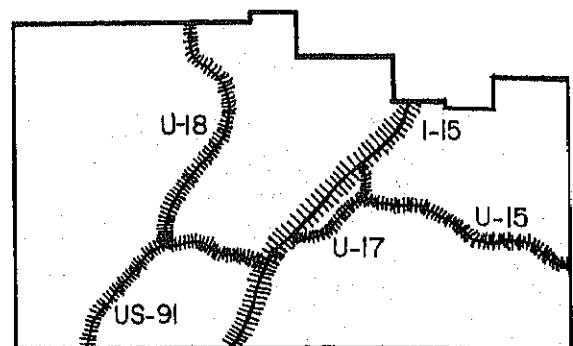
Dixie State Park

Dixie State Park—Smaller but equally important as a protected scenic area is Dixie State Park. Also classified as *green open space*, this park is included as a major framework element of the open space system.



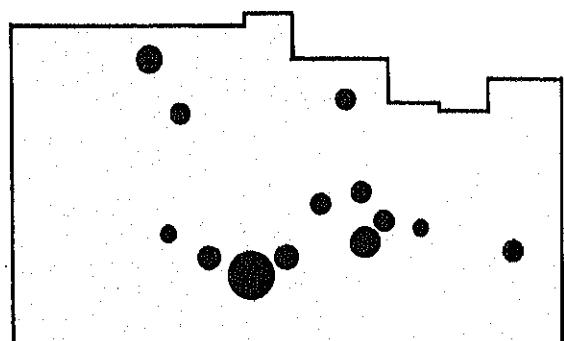
Interstate Highway 15

way 15—Upon completion, this major highway will be a basic element of the open space system. It passes largely through undeveloped land and also requires some protection from development to provide excellent opportunities for this highway as an organizing element of the open space system. Interstate 15 also is a *corridor open space*. In a sense, a part of the Interstate may be considered "free"; for the time being it is not yet in place. Once placed, however, it becomes a fixed element.



Other State and Federal Highways

Other State and Federal Highways—Of lesser importance, but significant, are those major highways in the county which contribute additional *corridor open space* potentials. While all segments of these corridors cannot be included as open space due to previous development, the highways do provide open space possibilities if considered at an early time.



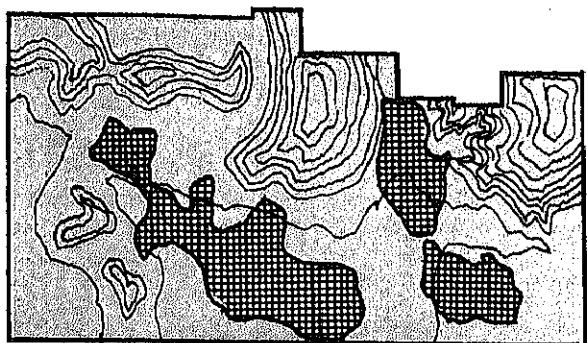
Communities

Communities—Although not to be considered as open space, the communities of the county cannot be overlooked in the open space framework. These are found to have a decided influence upon the basic open space framework. Among other things, the communities reveal those areas of more intense pressures for development land and thereby provide information on which areas require more careful classification for open space.

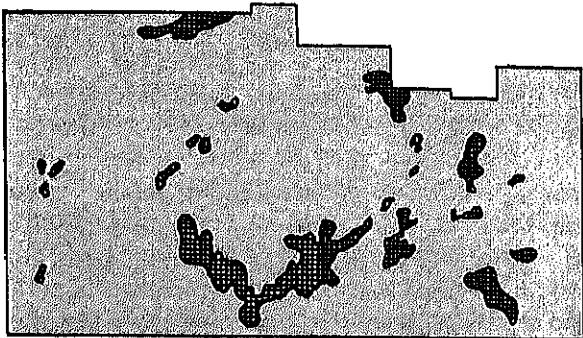
Free Elements

Water Sheds—These lands, classified as *utility open space*, perform a specific and necessary function and therefore need to be protected. This does not imply that these lands are to be restricted from development, but the type of activity

permitted must necessarily complement the water shed function. Maintenance of an open space character can be essential part of this function. Those shown in the illustration are some of the important water sheds on public lands only.



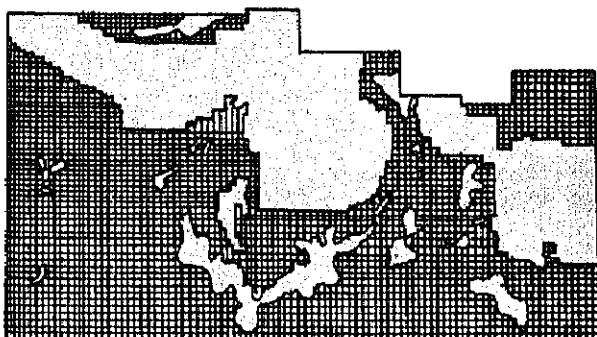
Water Sheds



Agricultural Lands

Agricultural Lands—These developed lands by their very use are basically *utility* type *open space*. Not only are the agricultural lands needed to maintain the economy of the area, but when properly developed they provide a very desirable type of open space.

Multiple-Use Lands—Where intense competition for lands has not yet occurred, past tendencies have been to allow a variety of overlapping uses. Those uses have included grazing of cattle and sheep, plus mining. As such, they become primarily *utility open spaces*. These kinds of spaces also require managed use if the multiple-use functions are to be complemented. For example, scenic and grazing aspects appear to be complementary land uses in many situations; whereas scenic and mining aspects will often work against each other.



Multiple-Use Lands

UNIQUENESS

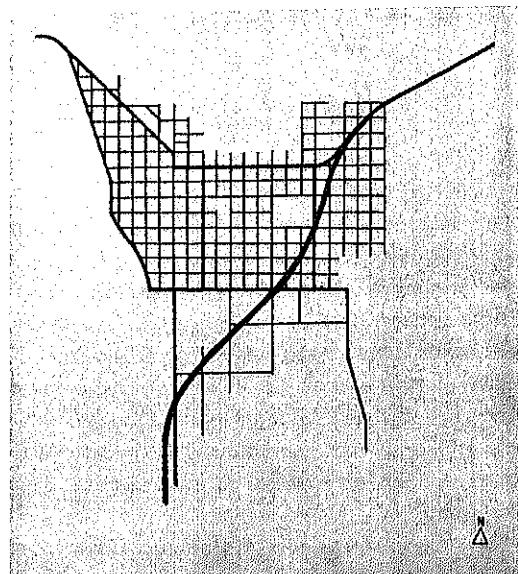
The uniqueness of land, by terrain and previously established uses, precludes providing a "package-program" whereby field personnel can quickly prepare either a general open space framework or a specific open space plan. Each region and locality will, because of its uniqueness, have its own framework of open space dictated in large part. Through judgement and with more specific data, the generalized framework can be expanded to the benefit of a specific locality.

These unique features of Washington County, previously identified, include the scenic attractions of otherwise open country. Specifically, the natural features of the area provide the basis of an open space framework for the County. In another situation, say a more densely developed area, the open space framework might be provided by the man-made development already in existence, perhaps roads, utility easements, major parks, etc. Each study area will need to be examined in light of its own unique features when an open space framework is to be established.

SCALE

Questions regarding assignment of land use most frequently occur at a scale involving a few acres. Certainly, they are not typically at a county scale. The open space framework as a guide to land use assignments must necessarily be extended to smaller areas if solutions to problems of land use assignment at these local scales are to be given guidance. However, it is with the smaller scale, county level framework that

relationships between open spaces are established for the local, larger scale areas. *The hierarchy of scale*, therefore, leads from micro scale, regional open space diagrams to macro scale, locality open space assignments of land use. An illustration of this change of scale is made in the case study of Washington County by extending from the micro-scale (county) framework to a specific macro-scale (local) situation in St. George, the largest community in the county.



Base Diagram of Community

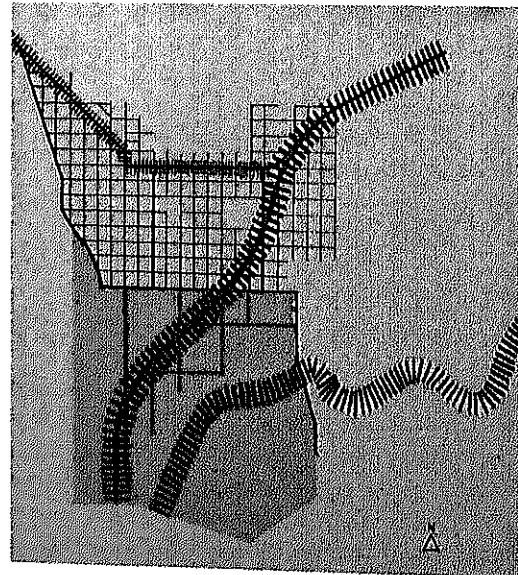
Base Diagram of Community—The study application is commenced with a base diagram of the grid pattern of streets, for St. George. To this base diagram are added those features which influence or help to determine the Open Space System.

Basic Micro Open Space Framework—The basic open space framework is first, replotted at the macro scale. Due to absence at this point of specific data at smaller scale, this framework can again be shown in diagrammatic form.

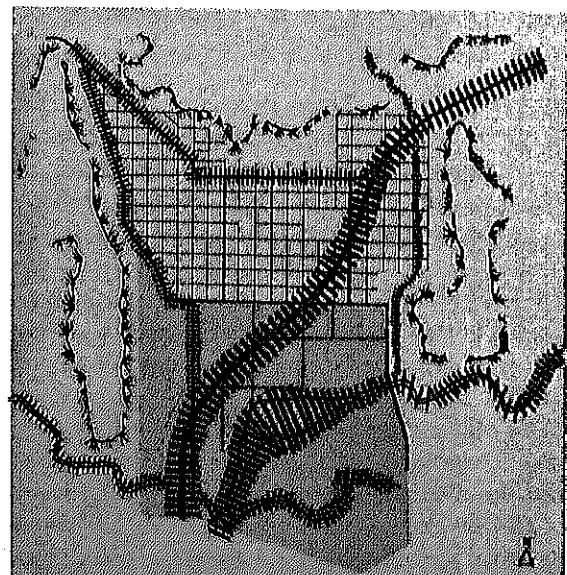
In St. George, the basic open space framework of influence includes the Virgin River, Interstate 15, agricultural lands, other highways, and watersheds. *Extension of the Open Space System*—Once the basic framework is established the larger scale permits inclusion of other natural and man-made features which are logical extensions of the basic open space system but which do not appear at the other scale. In addition, more specific features of the basic framework can be identified in importance.

For the St. George macro-scale study, watersheds, topological ridge boundaries, secondary highways, and a widening of the Virgin River appear as definite influences on the more general open space system.

Open Spaces of the Community—Specific, existing open spaces of every community also can be identified. These will be parks, playgrounds, lakes, reservoirs, utility easements, etc.

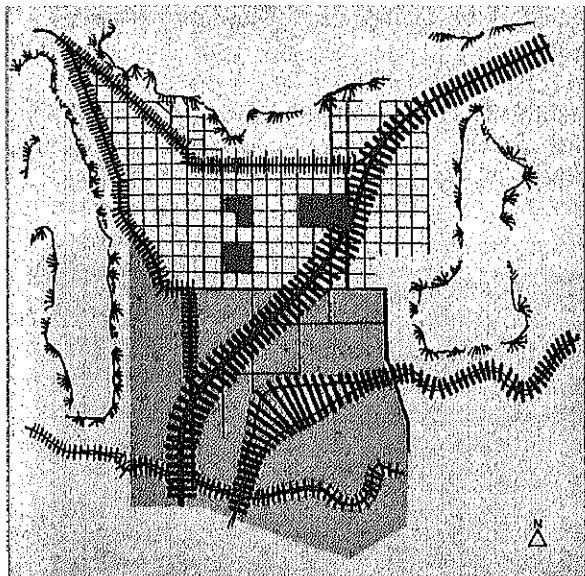


Basic Micro Open Space Framework



Extension of the Open Space System

For St. George, a variety of parks, school yards, and general use green areas are identified. These are added to the open space framework.

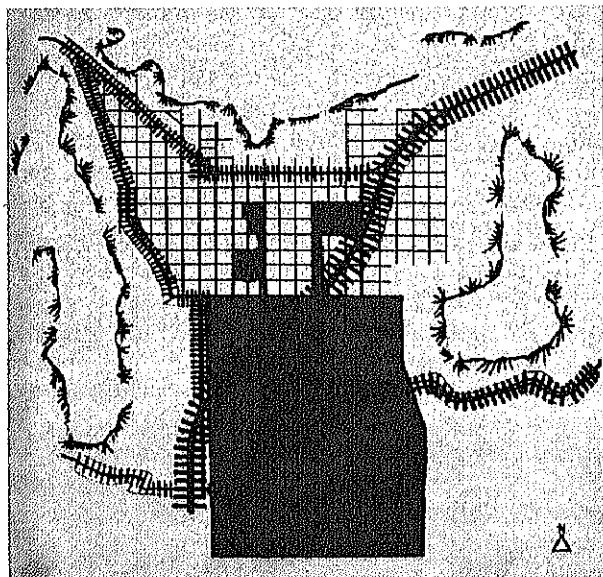


Open Spaces of the Community

CONTINUITY

The concept of hierarchy of scale is essential to development of an open space system of land use. It is through this concept that a continuity of open spaces is provided. Continuity, an essential aspect of any physical design process, is that feature which reflects the sequence of one's experiences in passing through space. This can be contrasted with a scatter pattern, either of planting or of open space, which by its disorder fails to add to our experience or awareness. A stream has continuity by its very nature. A system of open spaces will have continuity only by thoughtful assignment of land use.

Continuity of Open Spaces—This concept of continuity is most readily exemplified in the macro-scale study of St. George. The existing relationship between open spaces and potential open spaces suggested a linking and extension to the Virgin River. The agricultural land between is opportune for development of this continuity. Such a scheme also complements the basic open space framework established by the Virgin River corridor.



Continuity of Open Spaces

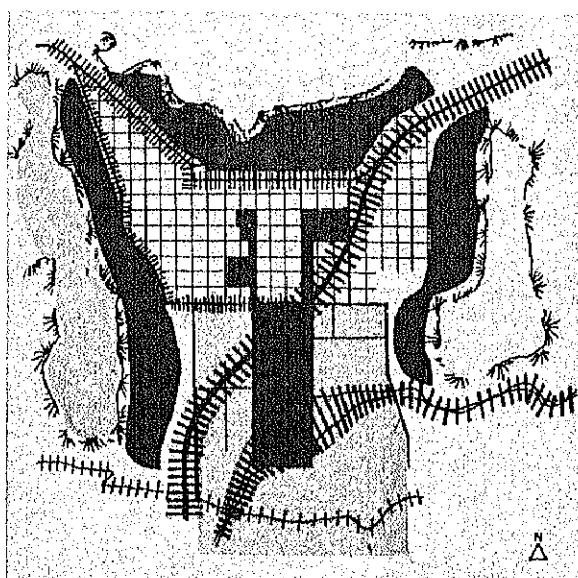
CLASSIFICATION

The base data, once gathered and evaluated, permits assignment and classification of open space. Evidently, not all lands need to be classified as open space. There will occur many situations where open space is not presently a major consideration in land use classification though in the future it may be. Also, even where expanses of land may be classified as open space on a general schematic, micro scale, it may not be found necessary to specifically classify all of this land in the same category at the macro scale. Some lands can be given a more general classification, such as "not classified," which permits more comprehensive classification at a later date when it becomes desirable to protect or enhance certain natural or man-made features; other lands might be given another open space classification.

Generally, because of its large area of coverage the micro-scale open space framework precludes more than schematic classification in terms of the three major open space categories; i.e., green, corridor, and utility. This has been the approach taken in the case study. It is at the macro scale that the wider range of open space classifications can be applied.

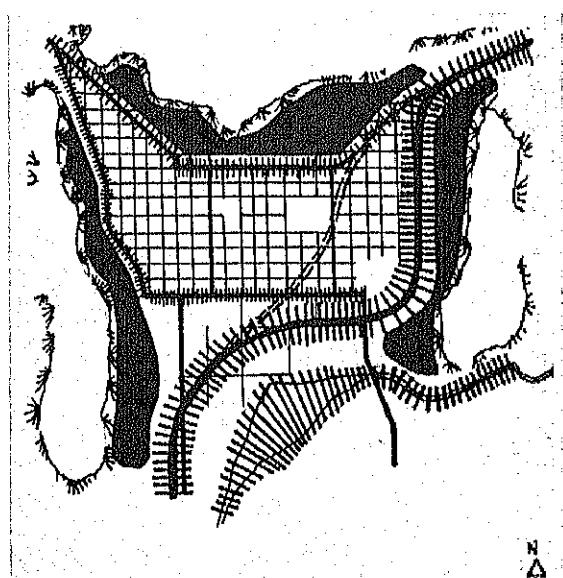
The St. George study is most revealing in this respect; for not only are more specific open space classifications quite evident, but alternative choices of land use are given direction.

Bluffs—Bluffs surrounding St. George are a strong land feature which suggest a need for protection. Protection of the bluffs as open space would eliminate present tendencies by subdividers to destroy their aesthetic value. This need not imply that subdivisions cannot be developed on table plateaus at the upper levels, but razing of the natural beauty of the bluffs by bulldozer road construction to these housing areas on the plateaus would be reduced and placed on a controlled basis. A green open space system of parks would fit appropriately with this need for protection of natural beauty.



Bluffs

Corridors—Protected green spaces as suggested along the bluffs also lend themselves to corridor spaces. Routing of road systems along these green belts then becomes an obvious choice. Such analysis shows that the existing Interstate 15 route might be better located as a complement to the open space system. As it is now proposed, the Interstate route divides the land naturally suited to development; whereas its location along the green open space of the bluffs complements the open space pattern along the bluffs without fragmenting developable land.



Corridors

DATA COLLECTION

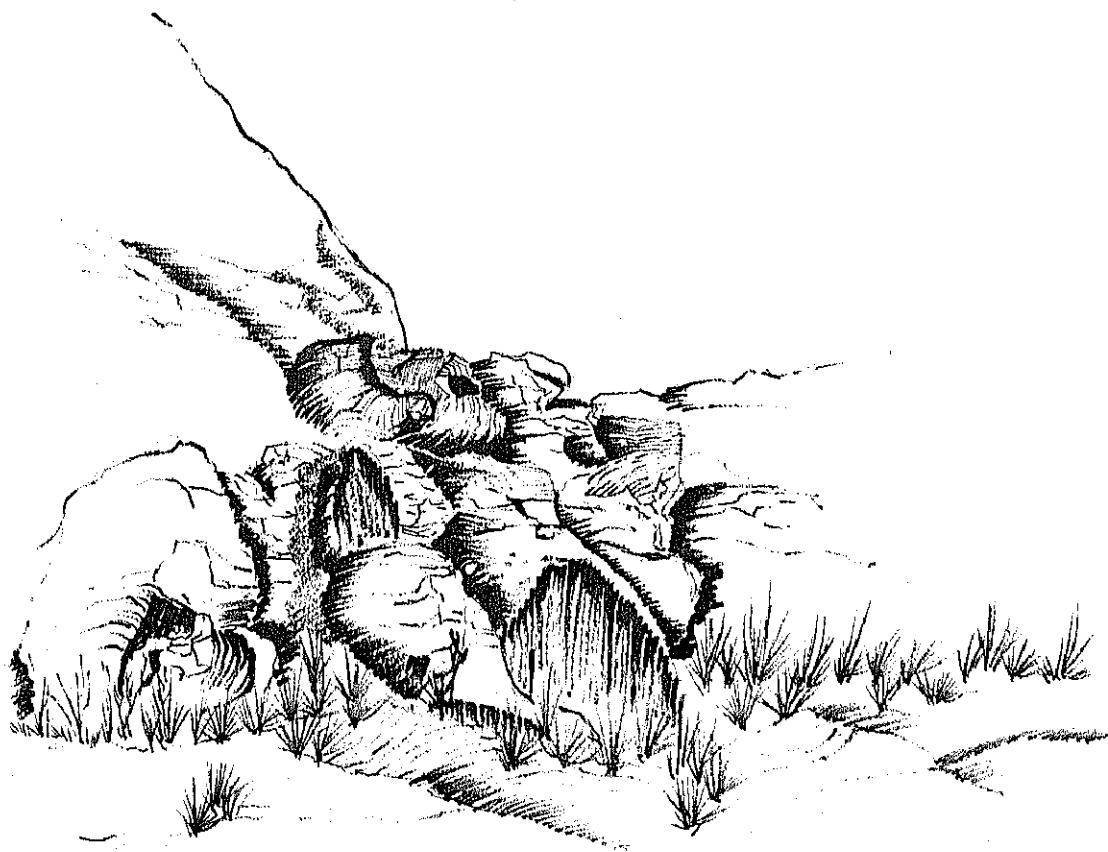
Physiographic, demographic, land use and land ownership data were an essential part of the open space application in this case study. Because assembly of this material constituted a major part of the application and testing effort, explanation on the process of data collection is provided as a guide to others who may be embarking on similar studies.

DATA NEEDED

Open space planning is carried out in a manner similar to any comprehensive type planning study.

Hence, much of the data needed in such studies is identical with that used in the comprehensive planning process. To be understood are existing natural and man-made features of an area, existing and historical trends in land uses, and population characteristics. In addition some broad understanding of urbanization process is needed if land development studies are to be made within existing and predictable patterns.

As a guide to field personnel who might be engaged in data collection, a list of material gathered for this case study is provided along with an explanation of the use or value of each. Included in the listing is that which was found as well as that which could not



Geological interest is stimulated when grotesque shapes meet the eye. Such formations offer visual experience both at close range and from afar.

be found or which was not assembled due to lack of time or other reasons.

Geographical and Topographical

Regional Relationships—Relationship of the case study area to regional urban complexes was mapped in order to establish the nature of urban land use pressures. Understanding of this relationship is essential in any planning study as an aid in projecting the land market and user market. Quantities and appropriateness of open spaces are given bases for assignment.

Topographical Mapping—At a regional scale or a local scale topography of the land plays a key part in the uses to which land is put.

At a county level, mountain ranges, rivers, and flat lands provide keys to development patterns. At a local scale, ravines, washes, streams, bluffs, etc. become influencing facts. Such data for the state and Washington County were available from a variety of sources.

Land Areas—The relative and absolute quantities of land, land uses, and water need to be established. Nearly all statistical surveys utilize this information in one form or another.

This data was readily available for both the State and Washington County though not from a single source.

Location of Communities—Relationships of cities of any regional study area need to be established if nearby urbanization pressures are to be properly evaluated. Such information is readily available.

Communications Routes—Highway linkages between regions, urban centers, and communities are instrumental in influencing land development. Location of these highway routes is needed and is generally available.

Land Use

Generalized Land Use Map of State—This data was not found mapped or assembled in any sources uncovered. The data is useful in establishing the nature and extent of urban and rural development and ought to be assembled.

Generalized or Specific Land Use Map of Washington County—This data was not located either. It is necessary to map (somewhat inaccurately) a generalized land use study of the county from areal photographs. This data is necessary in establishing more specific details on the nature and extent of urban and rural development.

Corporate Boundaries for Communities—Size and extent of communities need to be identified as a precedent to determination of statistical data. Corporate limits of communities, particularly small ones, are not often mapped, or collection of mapped data is difficult.

Land Use Map for Specific Communities of Locations—In the case study, a close examination of open space potentials was made for St. George, Utah. Land use was a factor of the analysis; for it exposed where and what kind of development has occurred and also revealed existing open spaces.

Sometimes, a community will have a land use map already prepared. St. George has such data; but it is lacking detail. This data was used in expanding the open space framework which appears earlier for St. George.

Demographic Characteristics

Population data is basic to understanding land development. Numbers, distribution, density, and change all are useful in evaluating and projecting land use needs.

This data was compiled both on a regional (state) and a county level as well as for each community. Clearly the more detailed the data collection became the more difficult it was to assemble the needed figures.

Land Ownership

Existing Land Ownership—Present ownership of land is essential data to acquire for several reasons.

First, extent of jurisdiction by various owner or management agencies needs to be known for decisions by one agency will certainly influence lands of another agency or owner.

Second, land ownership or control will in many situations indicate protected open spaces or other served lands.

This data was available on a generalized basis, but where wanted more specifically, time required for assembly was great.

Historical Change in Land Ownership—Equally important from a planning stand point is information on change in land ownership, particularly with respect to change from public or state ownership to private ownership. Such data indicates not only when and where land development has occurred, but also indicates intensity of development.

This data, although recorded, is not available in any summarized form, and time required to assemble it was excessive.

AVAILABILITY OF DATA

The availability of data needed for an open space classification study posed one of the great problems of the case study. The problem, however, was primarily one of fragmented sources rather than non availability of data. Although the data needed and used is fairly consistent with the needs of any comprehensive planning study, the findings of this case study reveal that most of the data has not been gathered together in any one single source. Probably, this is explained by the fact that such comprehensive data has rarely, if ever before, been sought for Washington County. Most of the needed data was eventually located and recorded, but only with great effort.

One part of this report on the case study treats the subject of basic data needs. Suggestions on improved data availability comprises another part of the study.

DATA SOURCES

Some data sources are provided which were utilized in the Washington County case study. Because of wide variations from state to state, these sources will be of little use for other than Utah planning studies.

Bureau of Land Management

The Bureau of Land Management is found to have in each district office a remarkably complete survey of

basic land ownership, land resources and major topographical features. Nearly all data included in the case study within these categories came from BLM sources. The completeness of this type of data is unquestionably explained as being of past concern to BLM in land holdings and management of the lands held.

On the other hand, BLM records were found to be almost non-existent in basic information needed to fully understand the types of pressures developing from urbanization processes. Data such as population mobility and density, historical trends in land disposal, and projected data for areas of urban expansion were found to be missing.

A basic kind of land use information on the "status quo" of Washington County also was found missing, but needed. BLM mapping and data recording does not include land-use information such as typically plotted for urban areas. That is, agricultural lands, community boundaries, land uses, and undeveloped lands are not separately identified. Further, BLM proceeds on a basis of plotting and recording only data which relates to the public lands. In fact, no comprehensive planning study, such as implied by establishing an open space framework, can proceed without a general knowledge of existing land use which covers all land. This data was necessarily filled in for the study from other sources. Unavailability of some specific land use information except by field check has resulted in a fragmented land use map.

State Land Board

The Utah State Land Board has since its beginning compiled an annual report which includes, among other data, yearly accountings of state land sales and selections. Thus, it is possible on a county basis, to establish some historical trends with respect to exchange of ownership. Regretfully, a change in reporting format by the State Land Board in 1942 does not permit following these trends through to current years. And, such data can be assembled only by a time consuming survey of Land Board records. On a count basis, and for the total state, the land exchange data provides good insight into periods of land demands.

Again, however, reporting methods are such that complete historical analysis of land exchange cannot be made. For example, from present records, it is not possible to determine within county boundaries just

where the land demands were greatest. This data was finally, though not completely, determined for the case study from BLM plotted atlas entries. This data is included in the case study report on a basis of ten year intervals, and it depicts very clearly where in Washington County the land selections and, therefore, the land demands were greatest.

Bureau of Census

Census data provided the complete population survey information. The population for the state and county were obtained from census data from as early as 1890.

Census data also provides general information on population distribution, although changes in reporting districts reduce the accuracy of comparative statistics.

Census data on agricultural lands in the state was found to be of little use. Apparently, land area in agriculture is identified with the county in which the land holder reports rather than in the county where the land is farmed. The result is data which does not represent the actual land in each county which is in agriculture. Thus, except for a state total, the data has no validity for this case study.

Corporate boundaries can be obtained with reasonable accuracy from Census Bureau maps. This data source was used to define community boundaries in Washington County.

U.S.G.S.

The U.S. Geological Survey maps provide the best available data regarding topographical features. Slope and elevation of the land for this case study were taken from these source maps.

National Forest Service

The National Forest Service holds records on forest land holdings historically considered. These records are not, however, summarized, and it was necessary in the case study to do the summary work from record books in the forest service district office.

An interesting finding from this data is that the acreage of forest lands has changed only the slightest from the early 1900's.

Computerized Land Ownership Programs

Research in computerized programs for mapping land ownership and status has been an on-going project at the University of Utah under the direction of Dr. Claron Nelson for the past several years. A computer study was investigated early in the Washington County Open Space Study to determine if any of this data might be usable.

Unsure direction at the early date in the case study combined with absence of specific examples of what was available from computer mapping resulted in a decision at that time to collect and map the data using conventional methods.

However, it is to be noted that once the case study had progressed far enough to expose the data needs and used, the computer program was used to provide comparable mapping data. Further, this computer mapping was done with considerable saving of time.

One example of computer mapping is included in the case study appendix. The example shown is comparable, indeed more accurate, than are the maps prepared from data otherwise obtained. Clearly, in some purposes of open space planning, computer programs for mapping of data can be utilized with considerable saving of time.

A computer program developed at the University of Utah for mapping of land ownership and status does, however, have one drawback. This is that the mapping can be done only for "status quo" situations. As the computer program is now developed, there can be no mapping of data in a historical context, although this type of data is to be of considerable importance.

State Department of Parks and Recreation

The Utah State Department of Parks and Recreation was found to have rather complete records, in summary form, of recreation areas in the state management. These records include location, size, and type of recreation resources.

Department of Highways

The State Department of Highways was found to have an essential kind of information on cities in the case study area. For their own budgeting purposes, this department has compiled sizes and areas of corporate communities in each county. This data was used to determine population densities and intensities of urban development for the state and county.

MISSING DATA

Certain kinds of information are essential to any comprehensive planning study, whether of an open space type, a transportation type, or a general land development type. Application of open space concepts of land use to Washington County required a few basic items. Among these are a map of existing land uses, a base map of the study area, population distribution, and topographical information. Some of these data needs were not available or could not be conveniently assembled.

Land Use Mapping

Probably one of the most essential of this group of basic data needs is the land use map. From such a map are prepared generalized land use maps, and analysis of urbanization pressures is made.

Such land use maps are not available except in the most urban areas of the state. It is suggested that at some time in the near future, someone, or some agency, will need to assume responsibility for meeting this need. Comprehensive planning cannot really proceed without this basic information. Apparently,

except for highly urbanized areas, counties and communities are not going to meet this responsibility.

Fragmentation

In the development of new concepts toward planning, it is no surprise to find that the kinds of data needed from which useful conclusions, even a general land classification, can be made are not conveniently located in one office or volume. However, if future programs are to be based upon the new ideas, convenient packaging of needed information is a must for field application.

Land Use Trends

B. L. M. records, while wonderfully detailed, do not show data on urbanization patterns. Further, some kinds of data which are kept in state and district offices are based on today's management needs. It is quite difficult to establish historical trends in land use from B. L. M. records.

Both fragmentation of data and some historical voids will need to be eliminated if field application of open space planning is to be properly done at a district level by B. L. M. personnel.

USEFULNESS OF OPEN SPACE PLANNING TO FIELD PERSONNEL – AN EVALUATION

An ultimate goal of open space planning is that the process be of some use to field personnel who might be engaged in assigning land uses both for tomorrow and for years ahead. If it is to be of value, open space planning ought to provide guidance to solutions of the following kinds of problems:

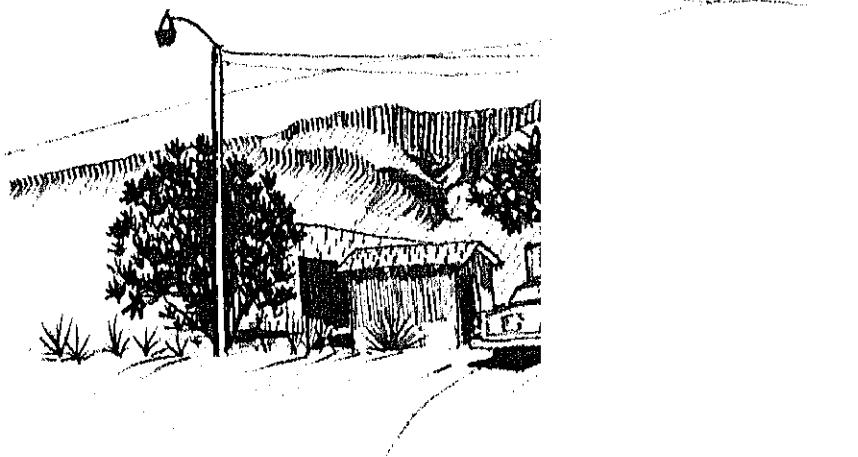
Determination of the highest and best use of land based upon need, uniqueness, and economic value. Determination of which lands to dispose of, which to reserve for future use, which to restrict in use for perpetuation of recognized value, and which to retain and manage indefinitely.

Determination of acceptable and reasonable uses for land to be released or restricted in use.

JUDGMENT IN APPLYING OPEN SPACE CONCEPTS

It is recognized that within each of the previously stated objectives occur a myriad of special, specific considerations. Yet, it is suggested that these represent the broad problems posed in land use determination for the Bureau of Land Management.

Open space planning can contribute towards answering these problems, both on a large and a small scale. However, it is to be recognized that most factors which form the basis of open space classification are



The natural elements of an area, such as the compatible types of land use to

more closely allied with subjective values, values of current and projected importance to our society, than with deductive logical processes. For example, a general classification of water courses as corridor open space is a definite reflection of present value judgements regarding their social and aesthetic importance. And when speaking of unique land features, we are reflecting value judgements regarding our current appreciation of them.

Therefore, judgement on open space classification is an essential piece of input to the process even though guidelines can be provided.

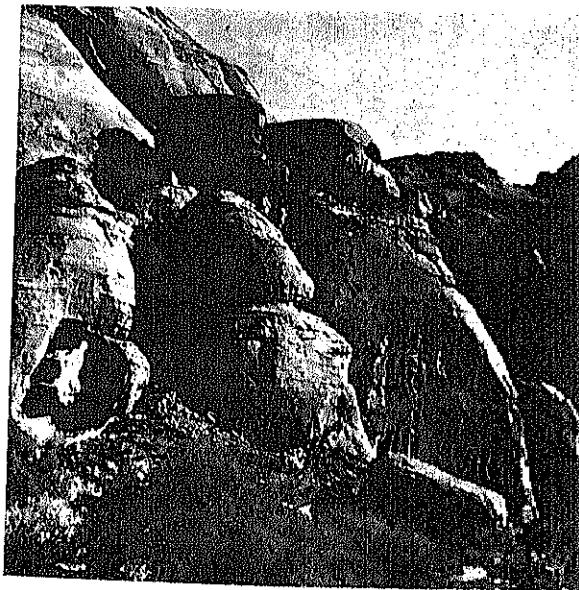
GUIDANCE FOR DECISION MAKING

Broad framework classification can be of definite help to the field person as he faces requests for land release. A situation which examples this appeared in a review of the Washington County, Utah, open space framework. B.L.M. district personnel, in looking over the open space framework, commented upon a recent request for release of land to a developer who was anticipating construction of a commercial establishment. When the land location was pinpointed, it was found to occur along an Interstate highway open space corridor. Now, this fact alone is not a sufficient basis for rejecting the request. However, it does verify that the proposed location can potentially reduce the effectiveness of an open space system, a system established to preserve the scenic value of Southern Utah highways. Therefore, the field personnel were provided an immediate basis for closer scrutiny of the request. This closer scrutiny will, of necessity, occur at a macro scale. At this larger scale, further classification can be made for the open space system in cognizance of features which complement the system. After this second level review, the BLM field office will be in a much better position to make a determination on the request.

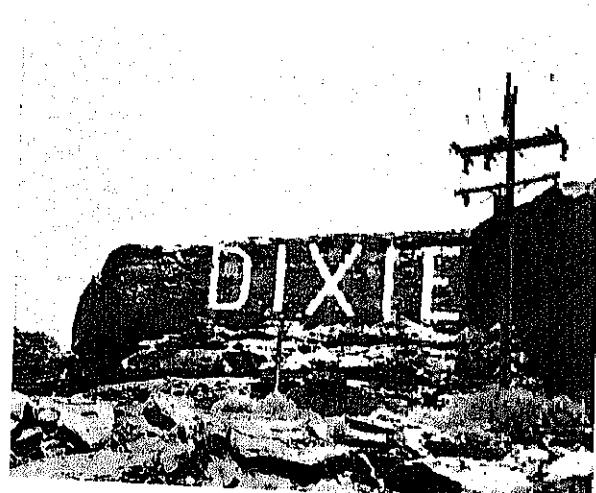
Evaluation Guides

What areas can reasonably be made available for development? What developments ought to be allowed which are compatible with the open space system? Answers to these questions will need to be given but are ones not so easily found. No clear-cut rules can be given to assist in answering them, but a few guides can be provided.

Protect Unique Landscape Features—Many natural features which are enjoyed by most of us can be lost forever through negligence or misuse. A case in point is the striking geological formations typical of Southern Utah and exemplified in the formations in the Red Cliffs Recreation Area.



Red Cliffs Recreation Area



Spoilation of Bluffs Surrounding St. George

Understandably, these features are usually the first to be sought or wanted as land undergoes development. Increasing development in the area often eventually results in the removal of this inherent natural vitality from our environment. If future generations are to enjoy these things, now is the time to

make certain they will still be a part of the future environment. These unique natural features, once identified, can be made an integral part of the open space system.

Respect Natural Drainage Channels—Natural drainage channels are cut by water run-off. In the dryer lands of the West these channels are typically non perennial. They are, however, equally as necessary as are constantly filled channels; for irregular and unpredictable storms vent their fury through these drainage paths. Generally, it will be quite difficult to alter the natural channel. Thus, any development which occurs in these natural channels assuredly runs a high risk of periodic washout and/or mud deposits. Certain kinds of developments, such as housing or other buildings, will invariably have periods of disaster or near-disaster if allowed to be constructed on these natural channels. On the other hand, some developments of an open space type lend themselves readily to location

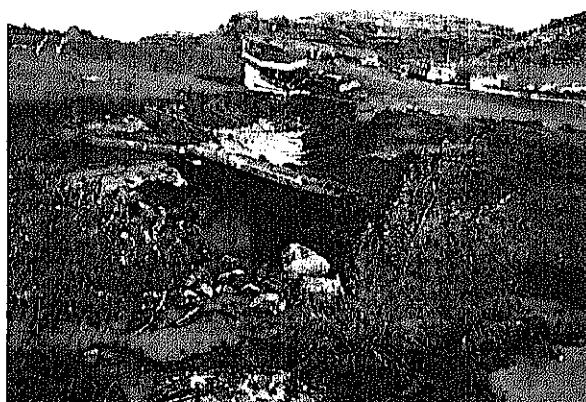
in these channels. Footpaths, parks, and golf courses (at least the rough) are but a few possible uses which can be integrated into an open space system and will simultaneously protect the natural drainage channels.

Retain Natural Vistas—Often a feature of unique beauty can be destroyed not by altering the feature itself but by interposing elements upon a scene which competes with and reduces the enjoyment of the feature. An example of this sort of visual interference is the highway billboard which too often projects into the view of a nearly scenic feature. Telephone and power lines often achieve the same undesirable effect. Overlooks can similarly be stripped of their value by encroachment from other uses.

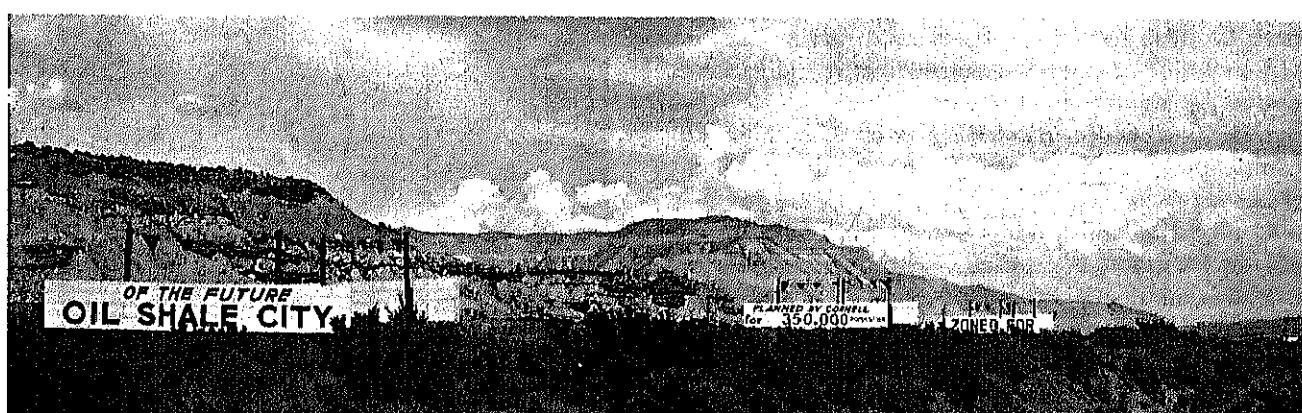
Where control of land is possible, these vistas ought to be identified. Then, when land requests are received, they can be evaluated in terms of their possible use effect on the vistas.



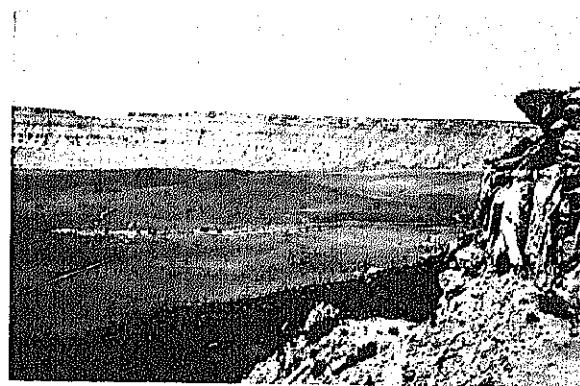
St. George Golf Course Sited In A Natural Drainage Channel



Washout of a Canal Constructed Across a Natural Drainage Surface



Highway Billboards Juxtaposed Upon A View of Scenic Importance



Overlook From Little Creek Mountain—Without Visual Interference



A Golf Course, A Gravel Pit, And Stock Corrals—All in the Same View

Evaluate Compatibility of Land Uses—Existing and potential uses of surrounding lands will undoubtedly be a factor of consideration in assignment of the highest and best use to each piece of land. Indeed, the scope of comprehensive planning includes the study of interrelationships between various types of land uses. And, the whole of zoning provides a legal basis for insuring this needed compatibility.

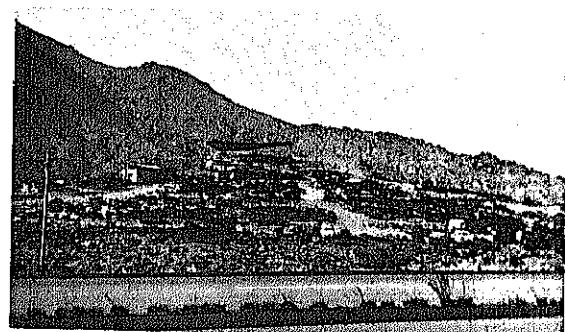
Compatibility of open space with surrounding land uses is equally as important as compatibility of residential uses with surrounding uses. Guidelines on compatibility need much discussion and expansion. Here, only a few examples can be given.

Competition for striking land features will invariably be keen. Often, some commercial venture will be the basis for development of the land. Some of these uses will be appropriate; others will not.

Highway construction has caused a blighting of many areas of the nation where gravel deposits are stripped for paving. Washington County is no exception. However, use of this natural resource need not

result in scarring of the land, though it often does. Regrading can be done to restore the land to its previous state.

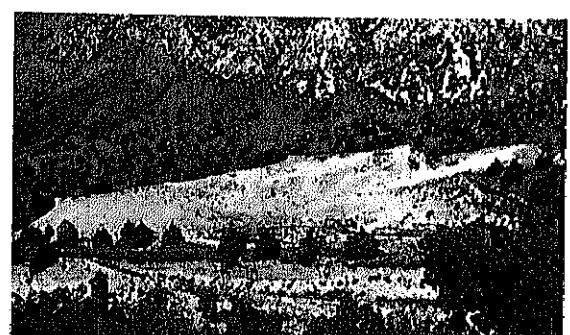
Mining operations have traditionally given little attention to total effect on the environment. In the process they have regularly scarred the land primarily through stripping of the surface and through negligent dumping of overburden. Mining, as with highway construction, need not leave the land scarred and visually incompatible with uses for adjoining land.



Junk Yard On Open Land



Auto Wrecking Yard Competes With a View



Despoilation Resulting From Gravel Removal For Highway Construction



Restoration After Removal of Gravel For Highway Construction

Evaluate Land Area Needs For Open Space—The amount of area needed for open space in any region, both for the present and predictable future, will be difficult to decide. While standards for urban areas have been established based upon population density and distribution, no such standards have been developed for non urban areas. Further, population density and distribution appear not to be viable criteria for deciding open space needs away from urban centers due to such factors as population mobility brought about by refined highway systems and changing social patterns of recreation and leisure.

Retain Open Space Patterns and Continuity—Evaluation of the highest and best uses for land should be tempered by apparent or existing open space patterns. The whole notion of an *open space system* is bound up in the concept of continuity. One example of this is illustrated in the discussion of an open space system for St. George in which existing open spaces of the community were complemented by additional open spaces planned to link the Virgin River more posi-

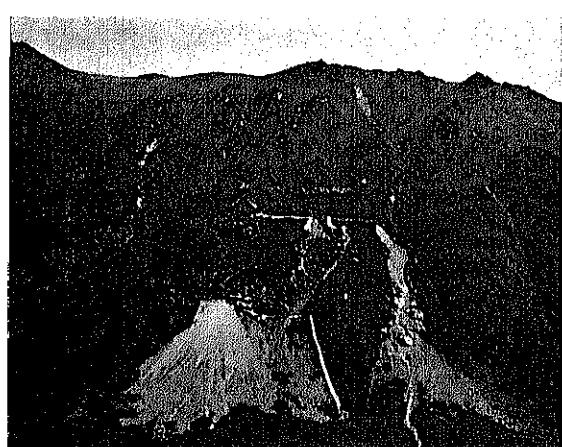
tively to the community. This concept of continuity will often provide a basis for assigning open space use where alternatives make the choice difficult or where all land in an area cannot reasonably be assigned as open space.

Evaluate Land Request In Terms of Predictable Future Uses—It will sometimes happen that land will be programmed or requested for uses where immediate competition from other needs does not occur and where the proposed uses are seemingly separate from questions of compatibility with adjoining uses. Such situations are often found in lesser developed areas, particularly in the West, where intensity of use has not yet exposed these problems of competition and compatibility. Apparent absence of these questions ought not, however, be interpreted as meaning they are or will not be important. Accordingly, land evaluation ought to be made based upon comprehensive planning principles to insure that the highest and best use of land will occur. In effect, this means for BLM that not every request for particular parcels of land will be valid. Which will be valid requires evaluation in terms of predictable future uses of adjoining lands and the relative importance of each use.

LAND EVALUATION

The broad open space framework is of use in another sense. The very process of developing the framework forces consideration of the highest and best use of land. In particular, the uniqueness feature of land is analyzed. In the case of Washington County, prime scenic lands, lands having recreational potential, readily fall into open space categories. Knowing that these lands are limited and, once destroyed or scarred, are not replaceable will unquestionably be an influence in determination of requests for disposal or lease which include such lands.

One of the more difficult aspects will be found in applying open space planning concepts at a localized scale, that is, at a macro scale. The problem can be identified with the recognized fact that not all land can nor ought to be restricted or retained. Such a procedure would be contrary to free enterprise and would probably be economically disastrous. This comment applies to land which falls into some parts of the open space framework as well as more obviously to land not classified within the open space system. The land

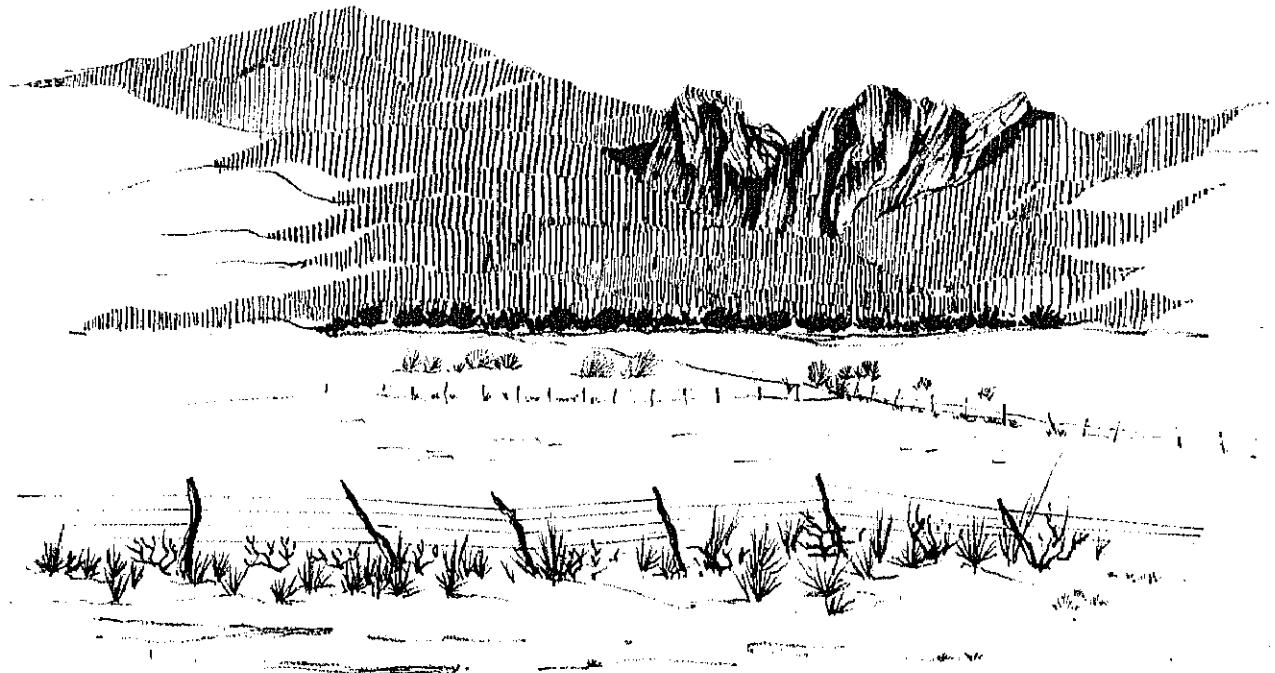


Mining Overburden Carelessly Dumped

contained within the corridor open space system of Washington County is a case in point. It is unreasonable to assume that all land within this corridor should be retained indefinitely or restricted. Some

private development will be demanded. However with an open space system basis for reviewing problems, decisions more in accord with the highest and best use of lands will unquestionably be made.

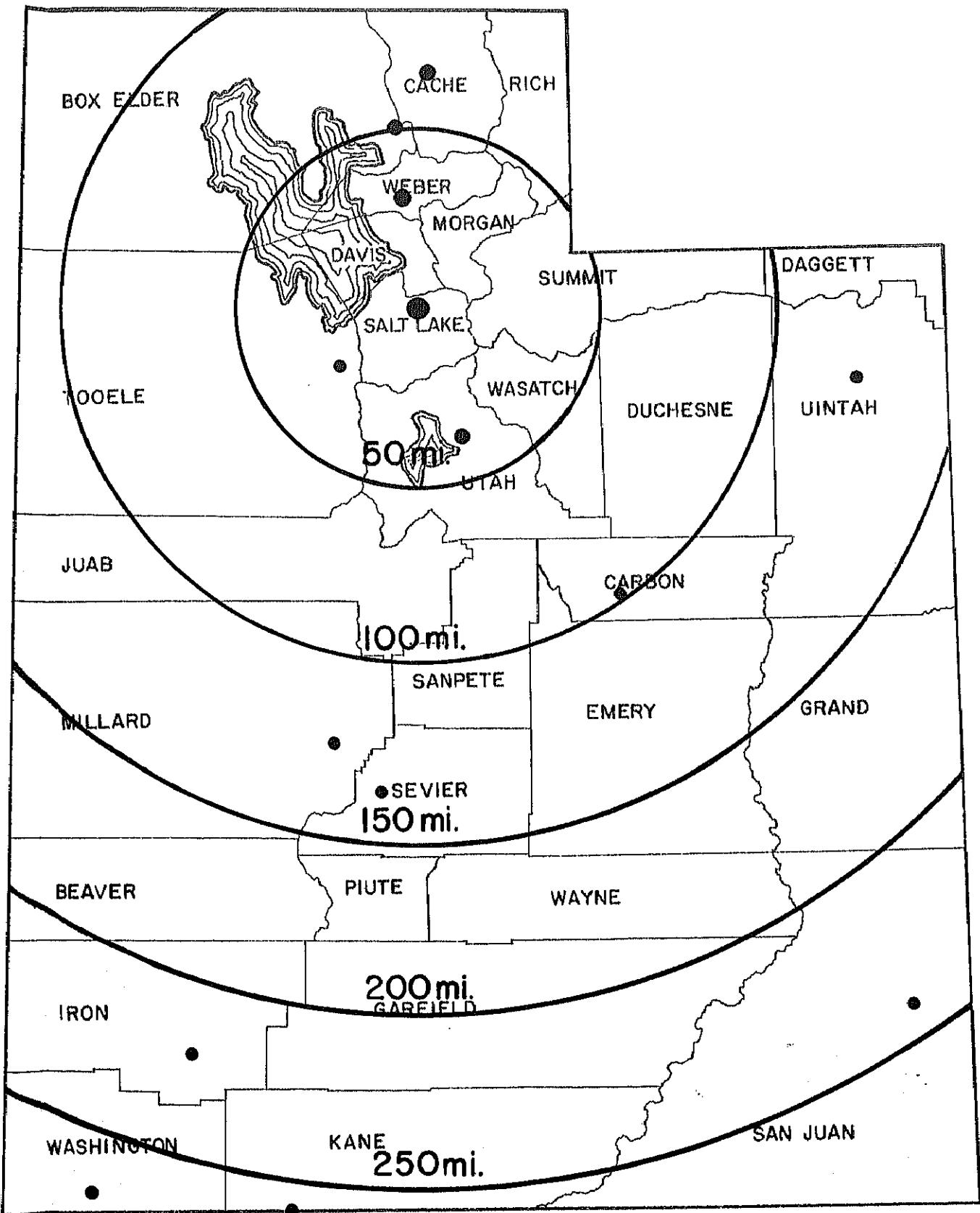
APPENDIX

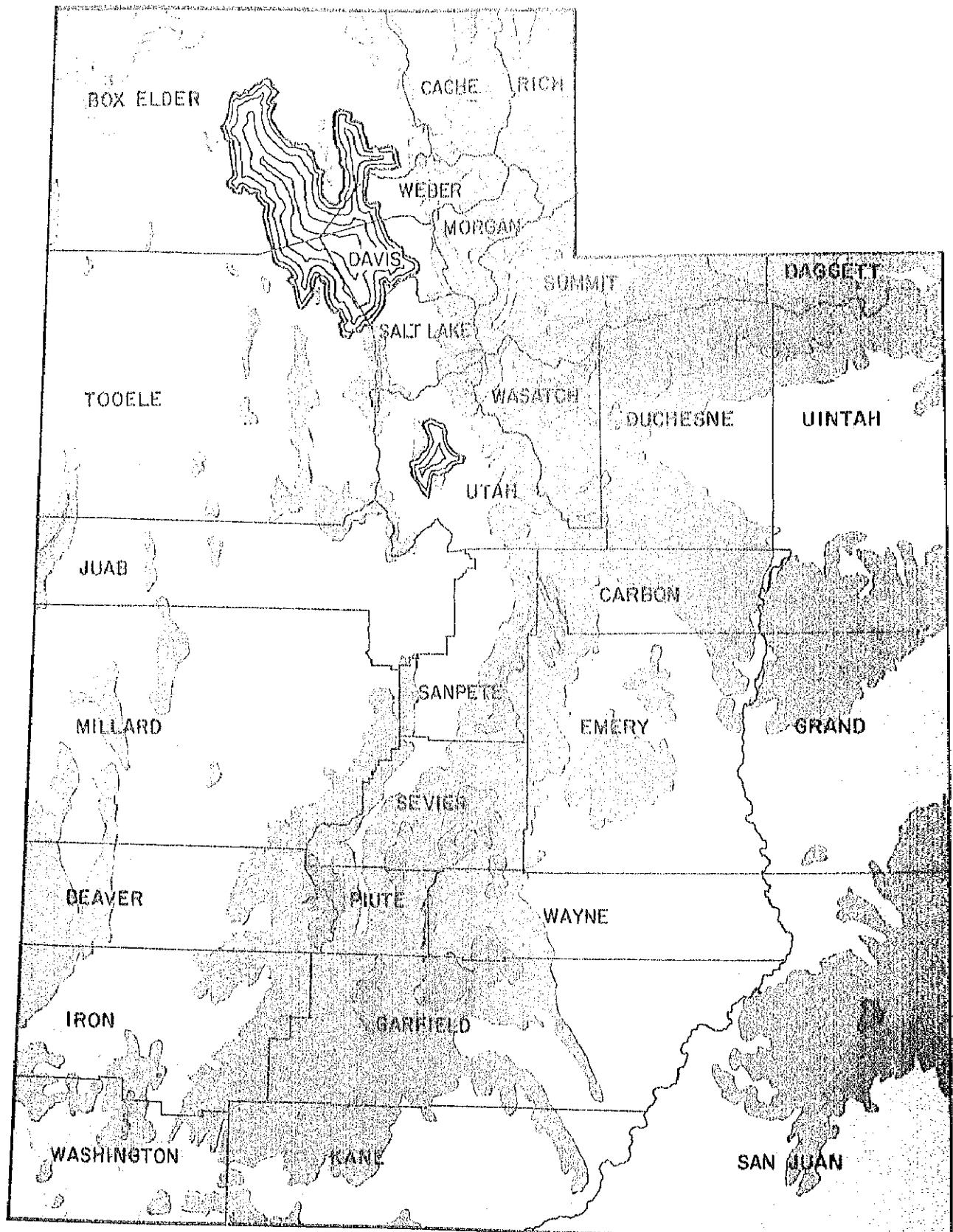


Agricultural lands contribute to the total open space system.

Appendix A

GEOGRAPHICAL AND TOPOGRAPHICAL

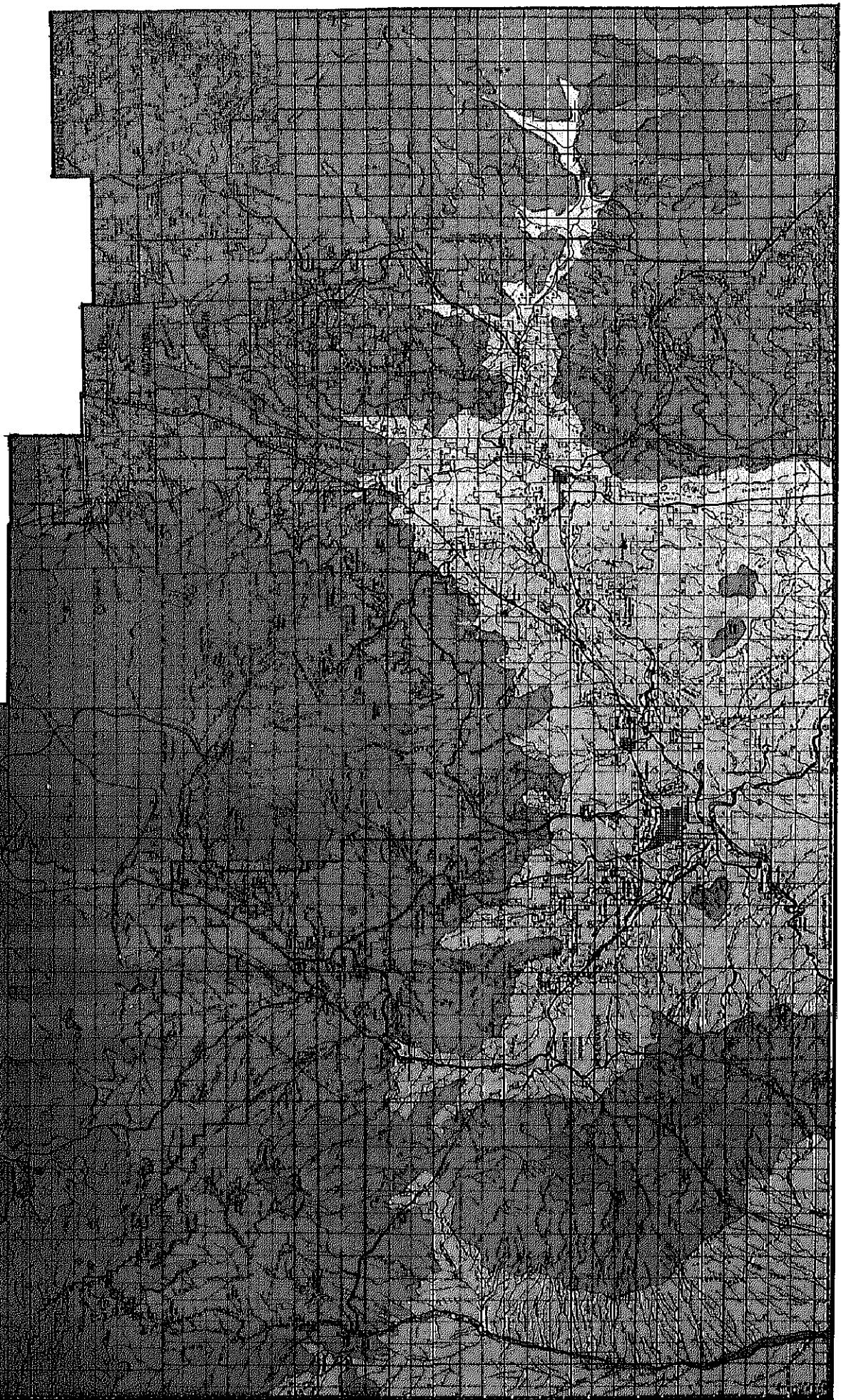




102

UTAH TOPOGRAPHICAL MAP

- 9,000-12,000
- 6,000- 9,000
- 4,000- 6,000
- 2,000- 4,000

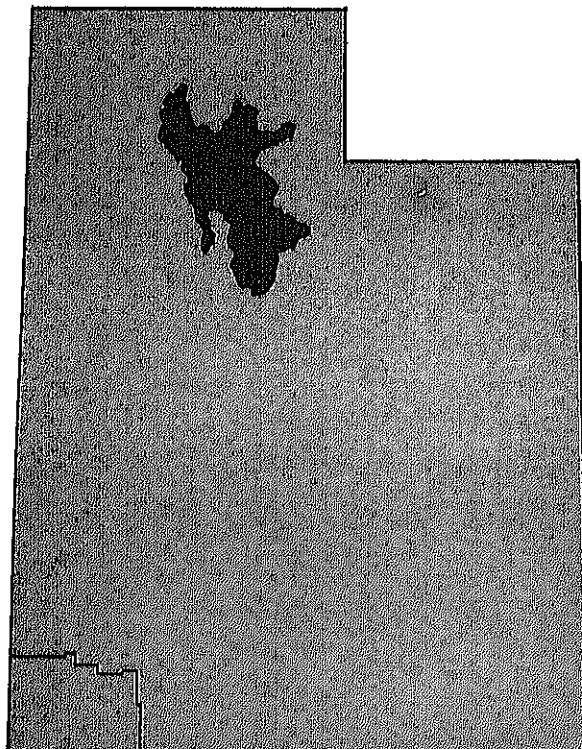


- 6,000-9,000
- 4,000-6,000
- 2,000-4,000

Washington County TOPOGRAPHICAL MAP

scale in miles

AREAS

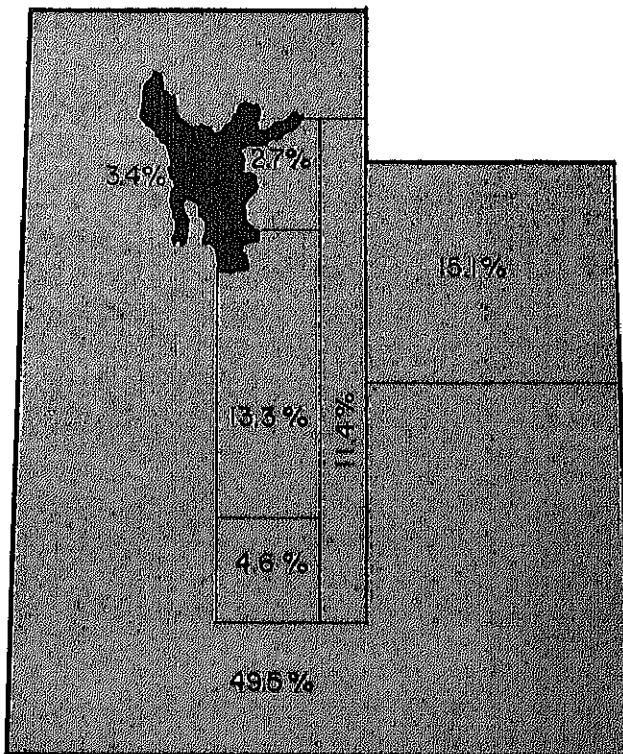


UTAH

Total Area	84,990 sq. mi.	54,393,600 acres
Land Area	96.6%	82,184 sq. mi.
Water Area	3.4%	2,806 sq. mi.

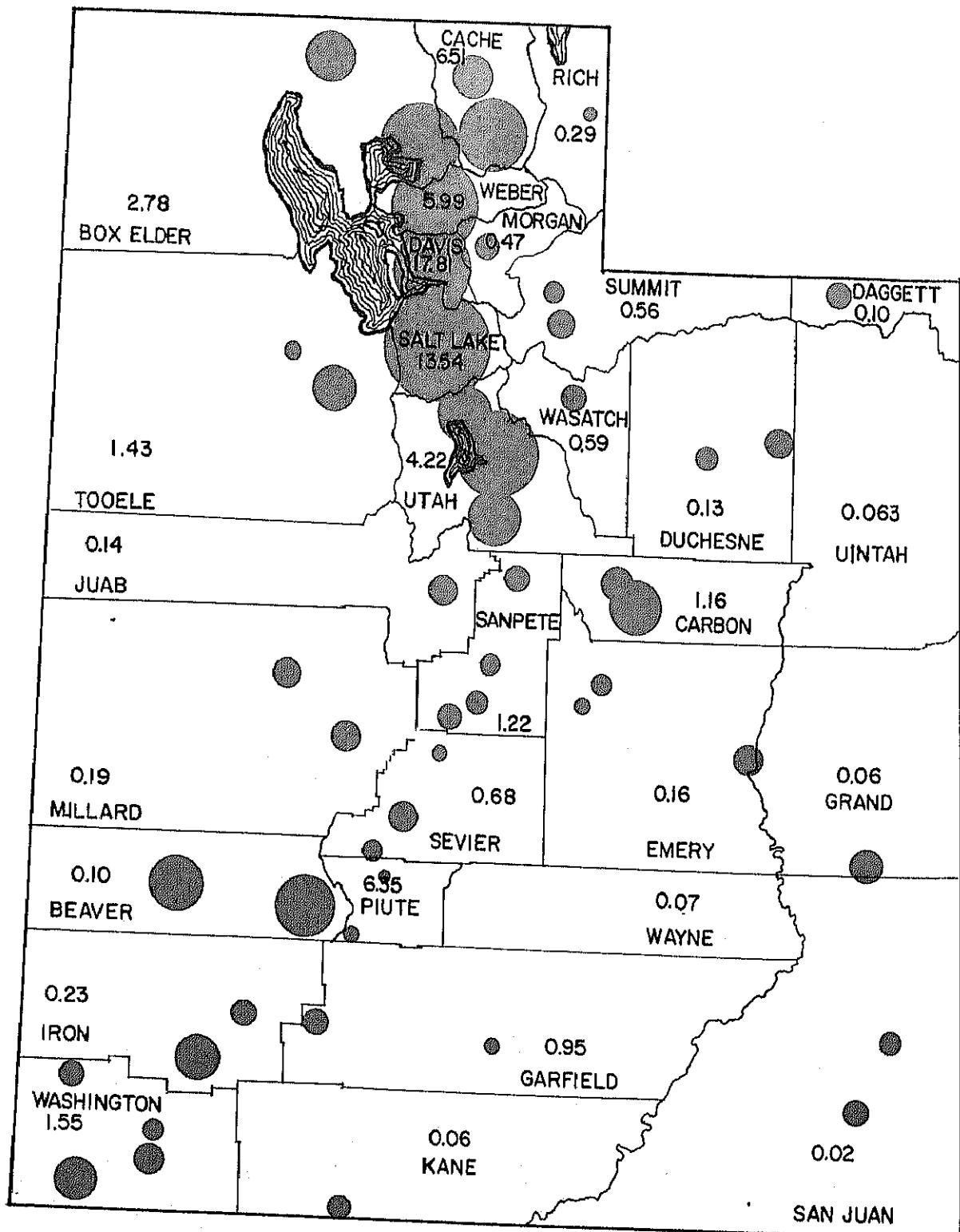
WASHINGTON COUNTY

Total Area	2,375 sq. mi.	1,552,000 acres
Land Area	100.0%	2,375 sq. mi.
Water Area	0.0%	1,552,000 acres

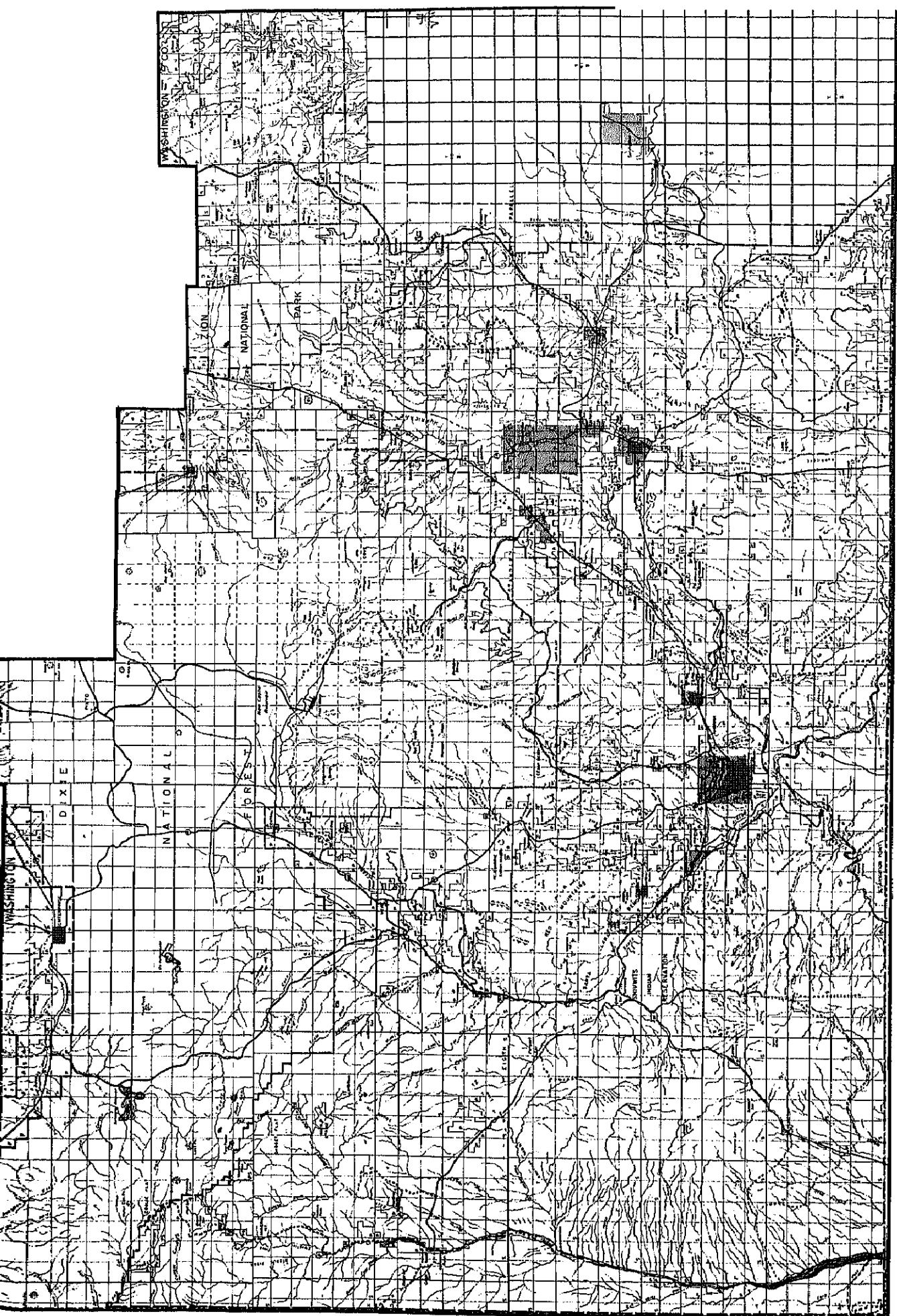


Public Lands	49.5%	42,072 Sq. Mi.	26,924,832 acres
National Forests	15.1%	12,835 Sq. Mi.	8,213,435 acres
Private Grazing, Dry Farming Withdrawals,	13.3%	11,303 Sq. Mi.	7,236,454 acres
Reserved	11.4%	9,688 Sq. Mi.	6
State Lands	4.6%	3,909 Sq. Mi.	
Water Surface	3.4%	2,889 Sq. Mi.	
Irrigated Lands	2.7%	2,294 Sq. Mi.	
		TOTAL	

LAND IN UTAH



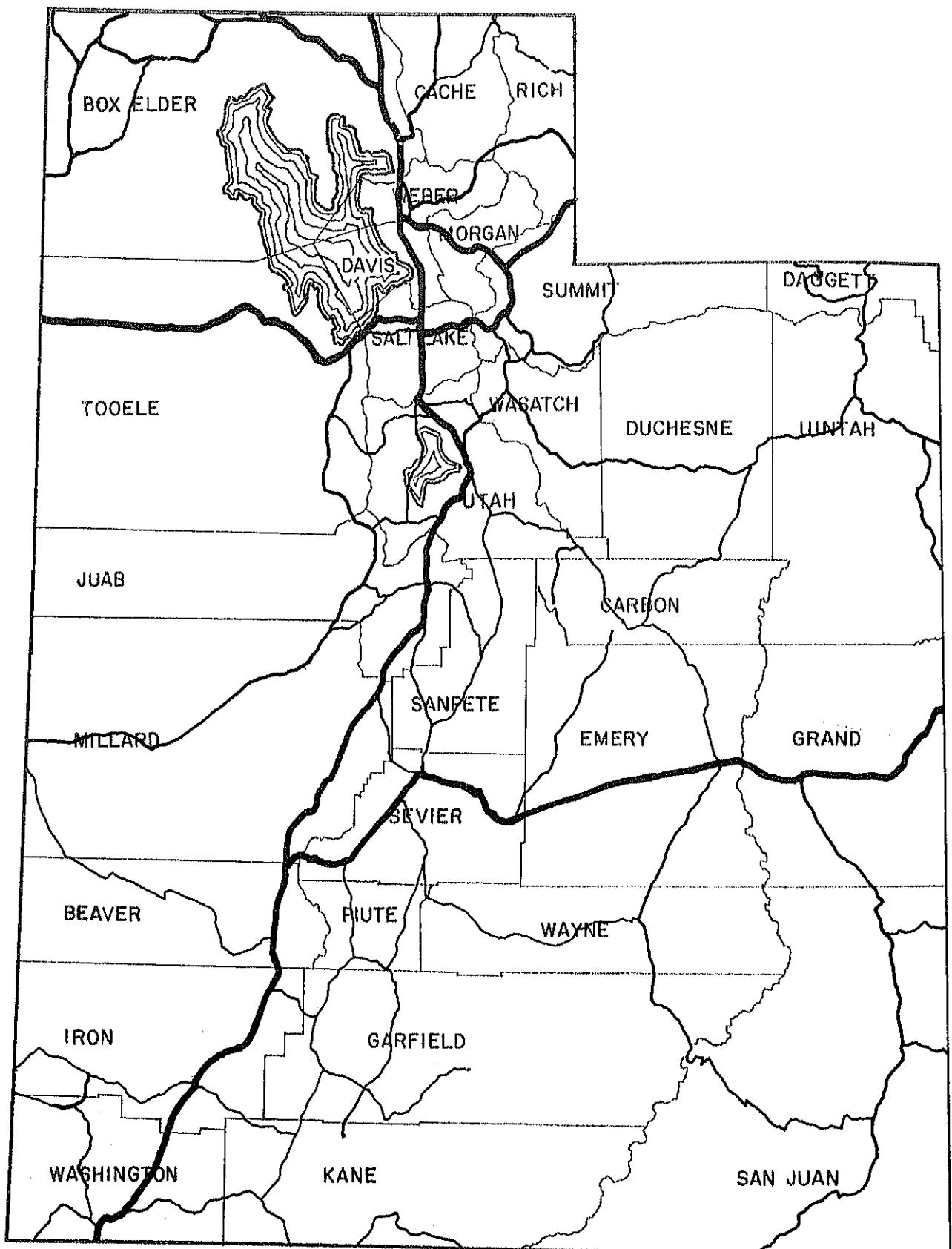
PERCENT OF COUNTY LAND IN INCORPORATED CITIES
 and
 GENERAL DISTRIBUTION OF PRINCIPAL CITIES FOR
 EACH COUNTY

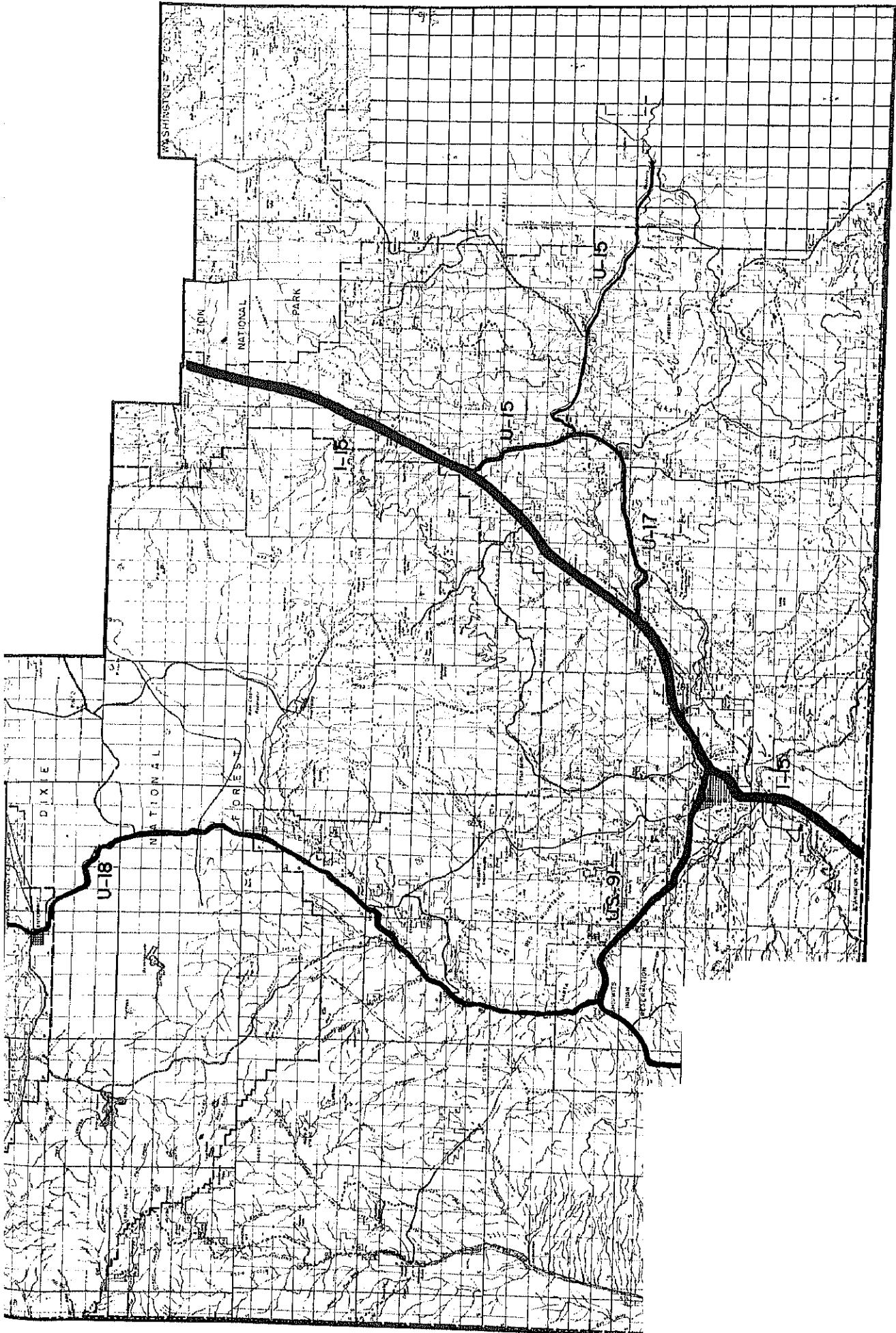


● COMMUNITIES

Washington County

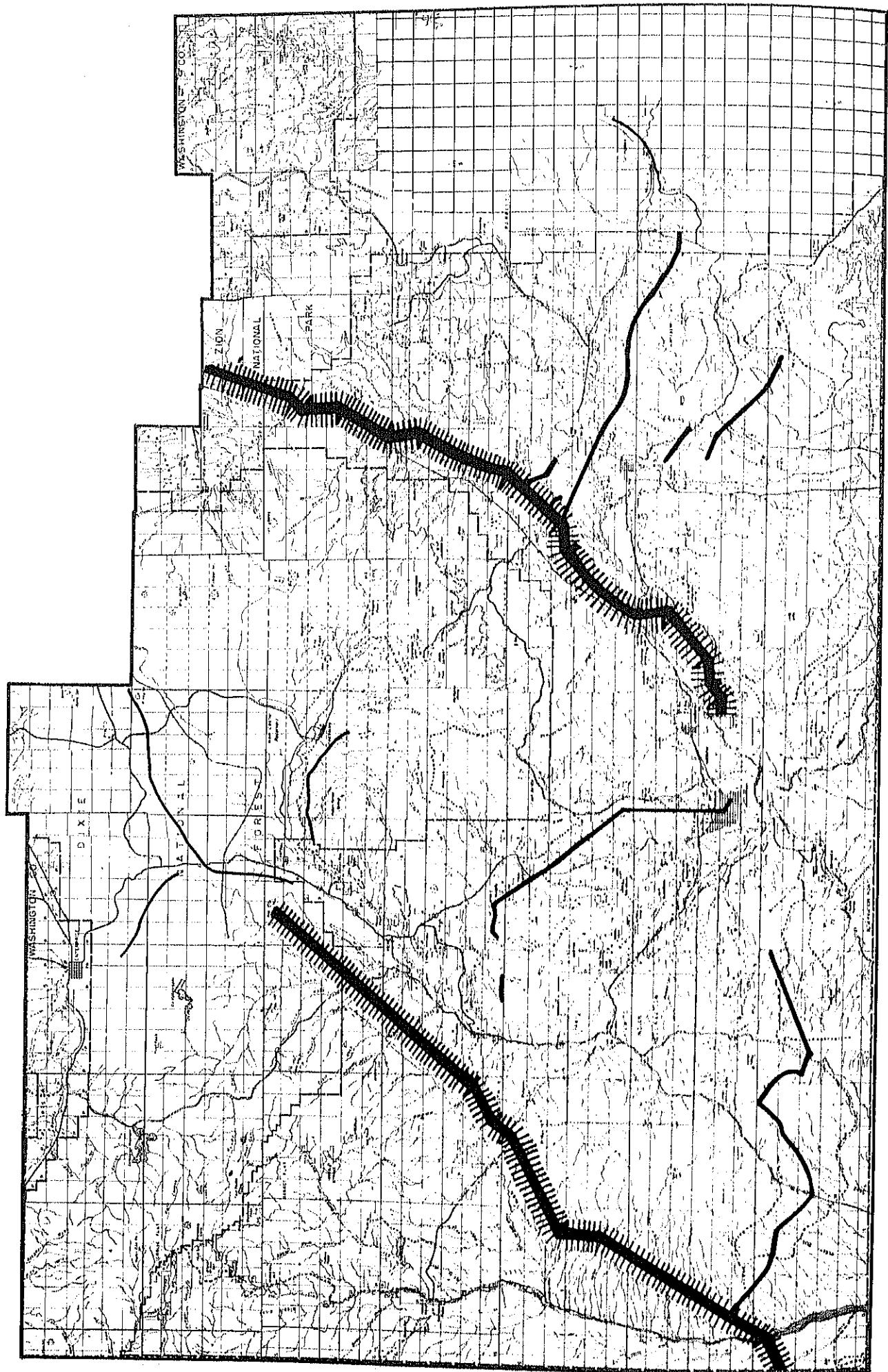
Scale in miles

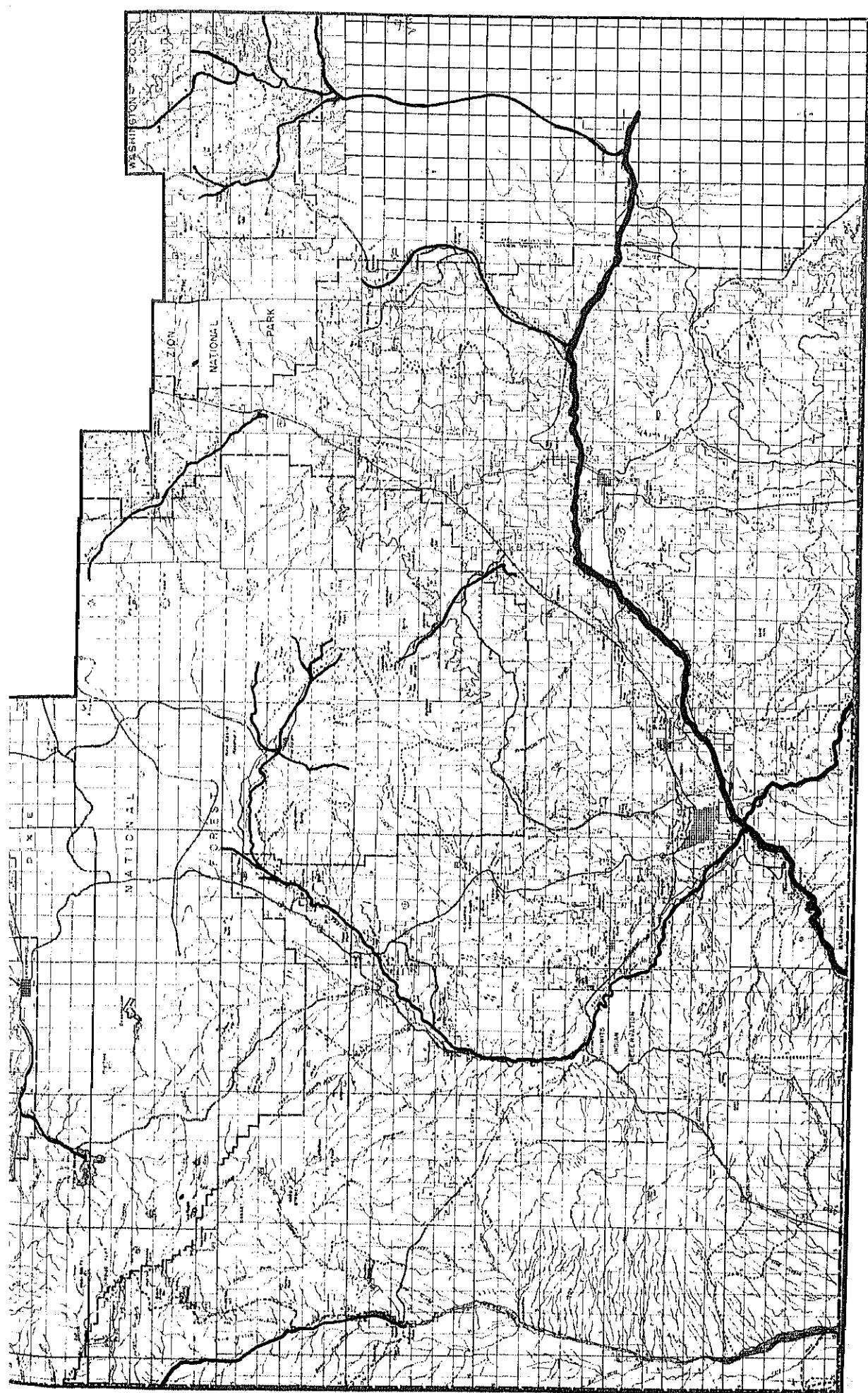




county

PRIMARY ROAD SYSTEM



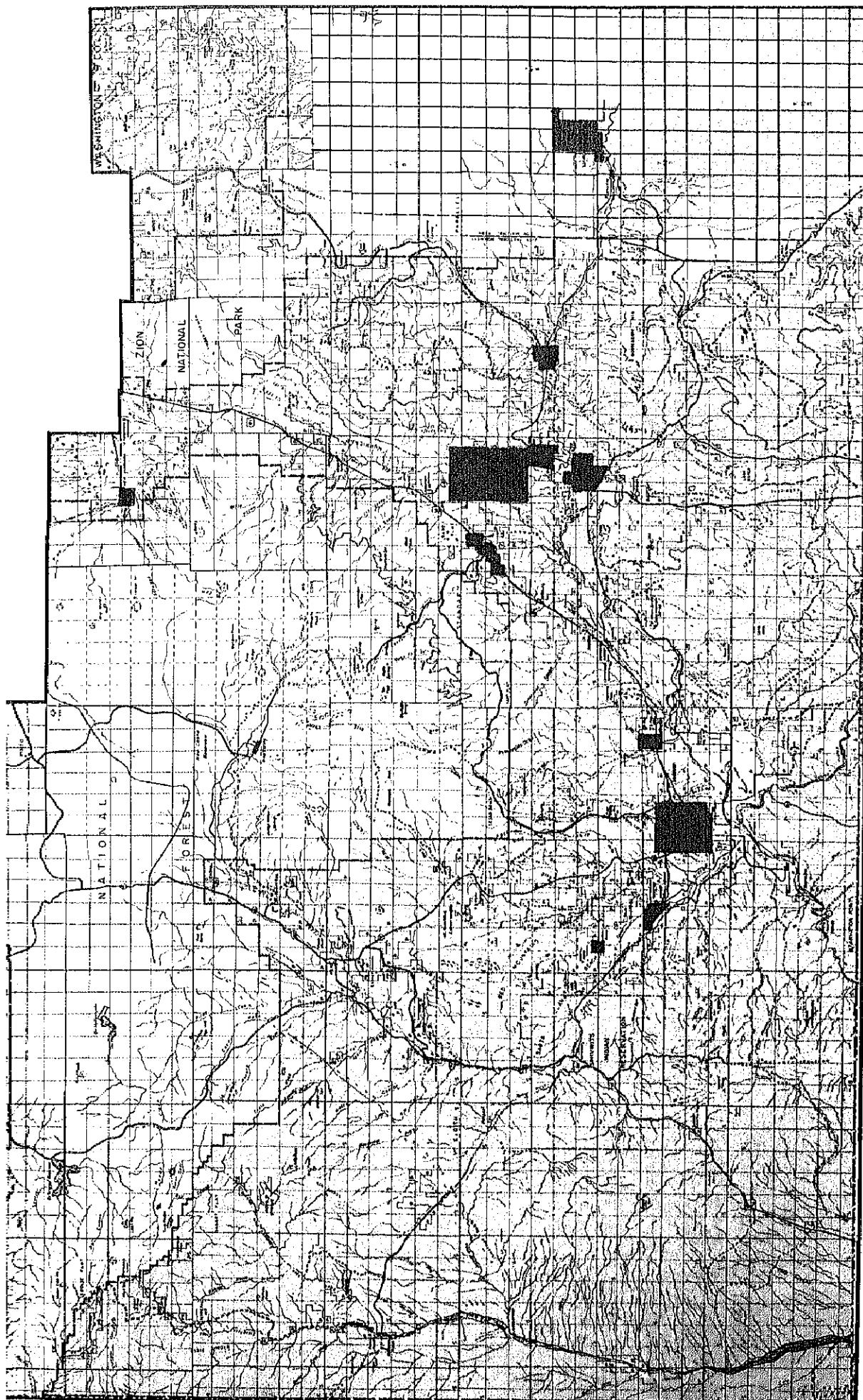


Washington County

PERENNIAL WATER COURSES

Appendix B

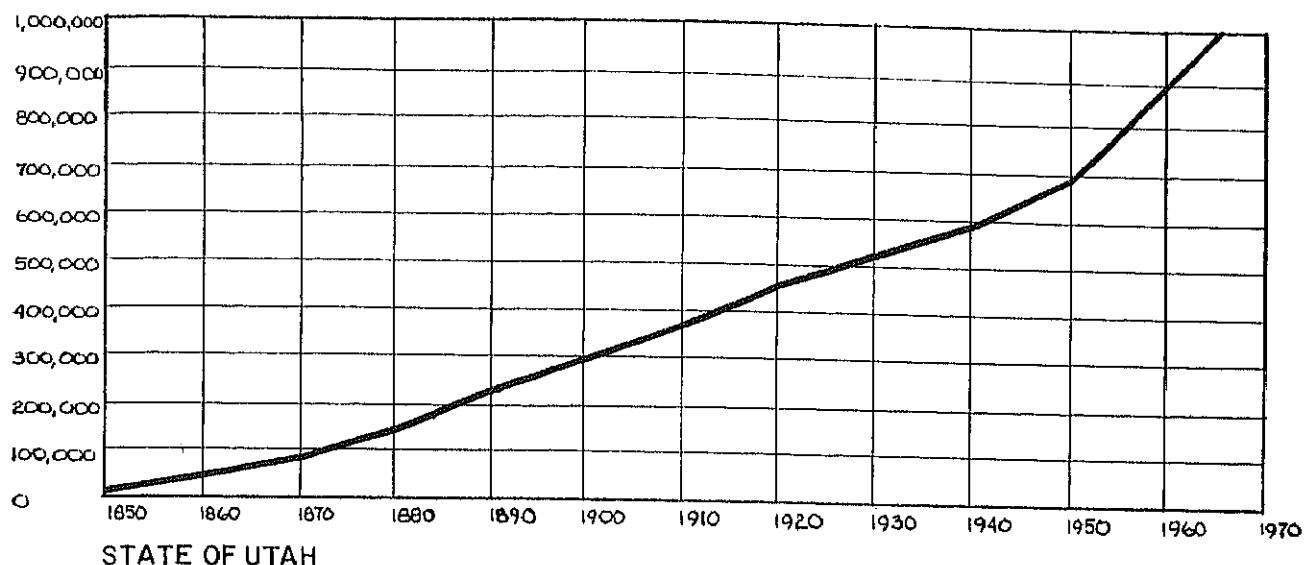
LAND USE



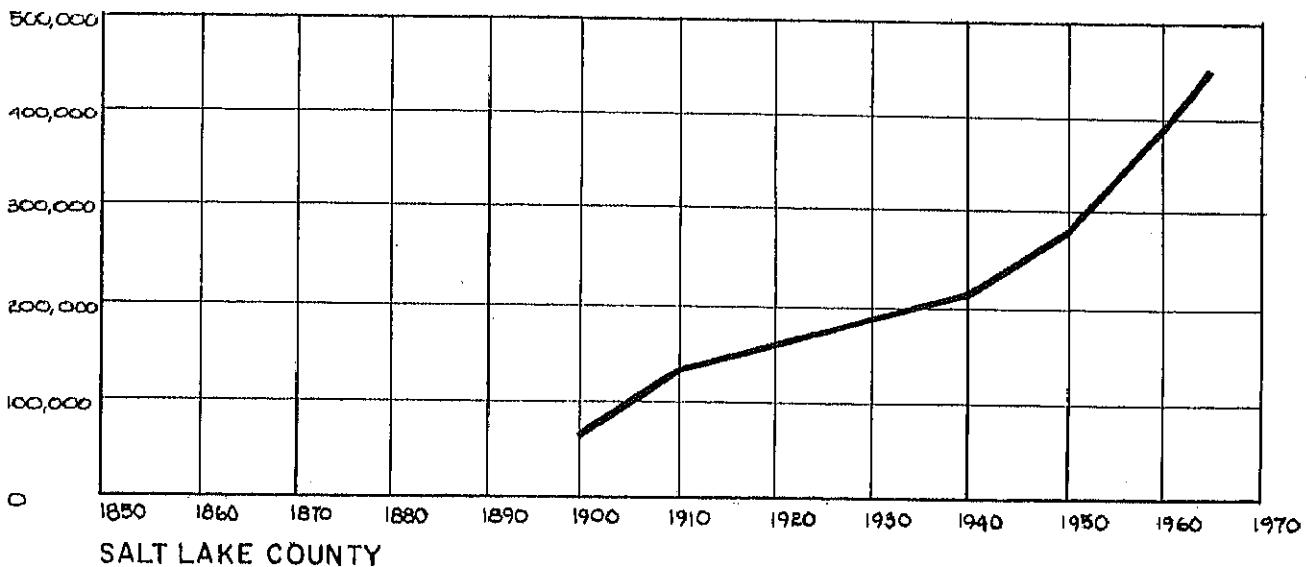
Appendix C

DEMOGRAPHIC

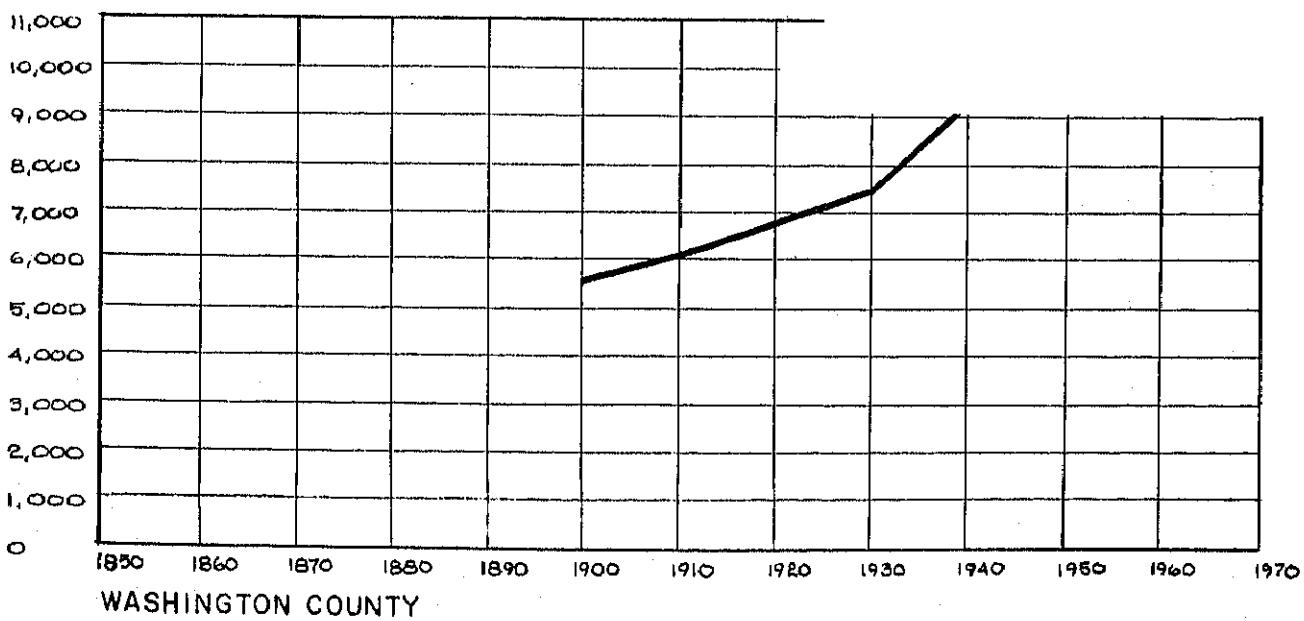
POPULATION GROWTH



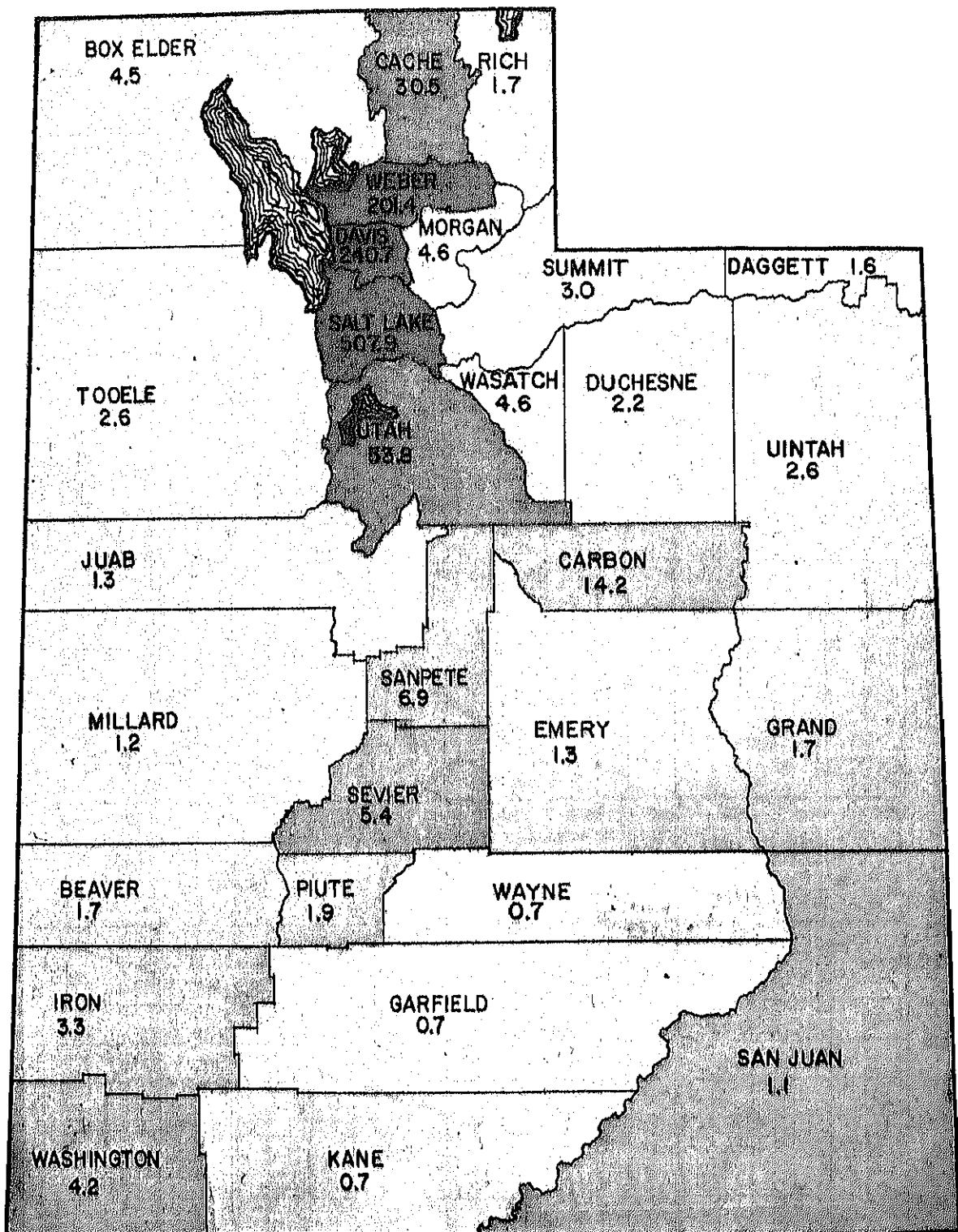
STATE OF UTAH



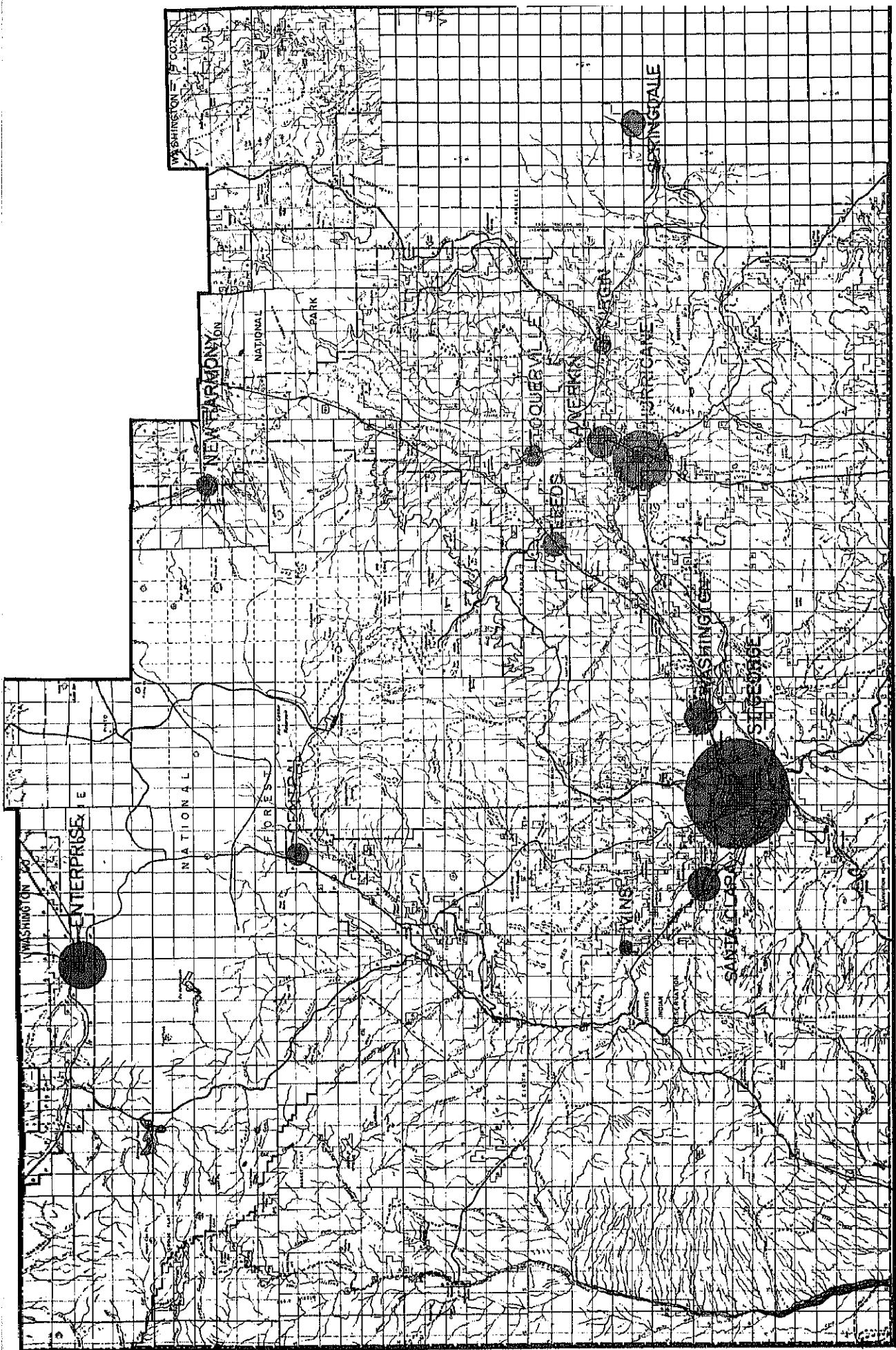
SALT LAKE COUNTY



WASHINGTON COUNTY

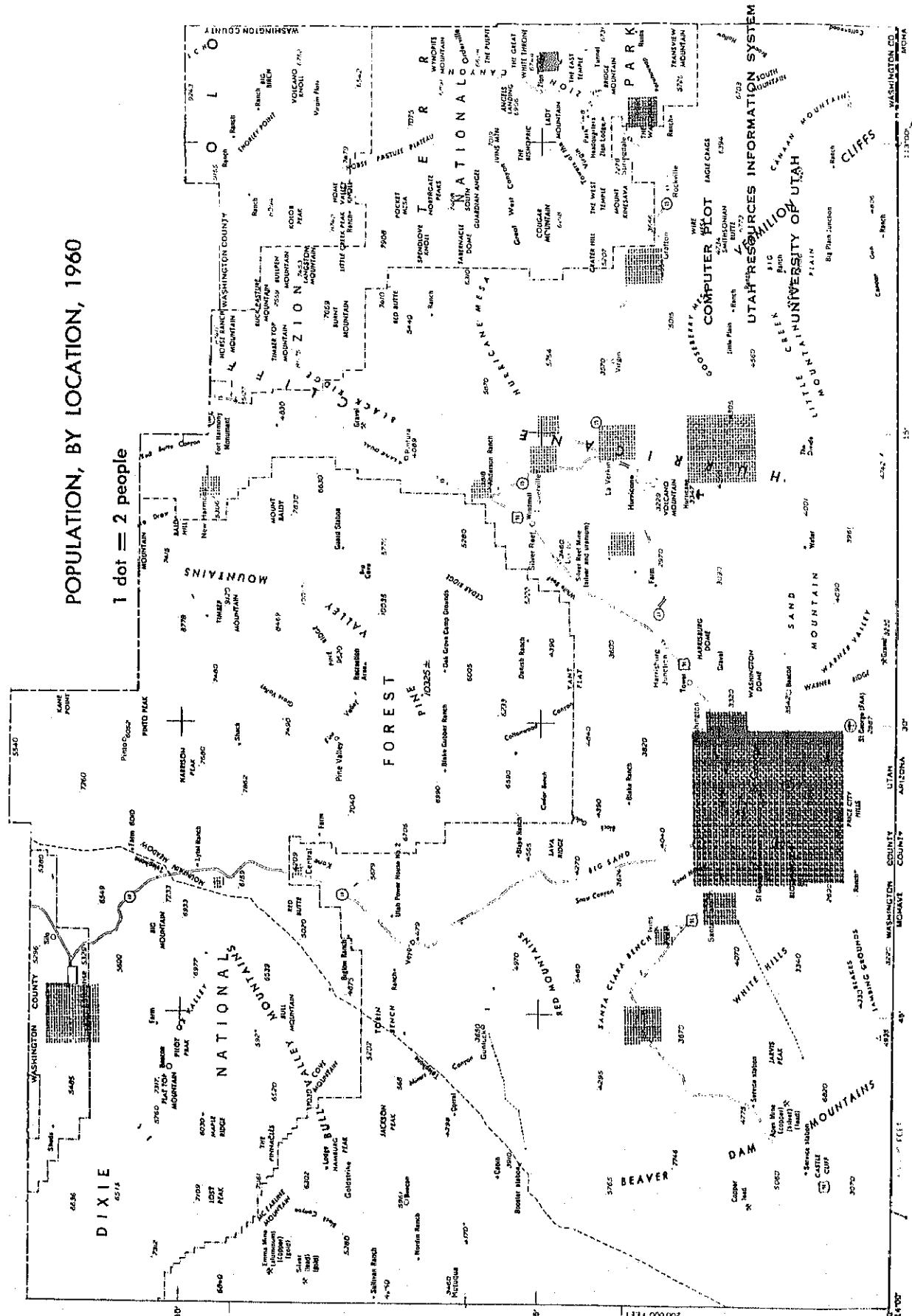


DENSITY
Persons Per Square Mile of Land Area



Washington County

POPULATION DENSITY AND DISTRIBUTION - 1960



Appendix D

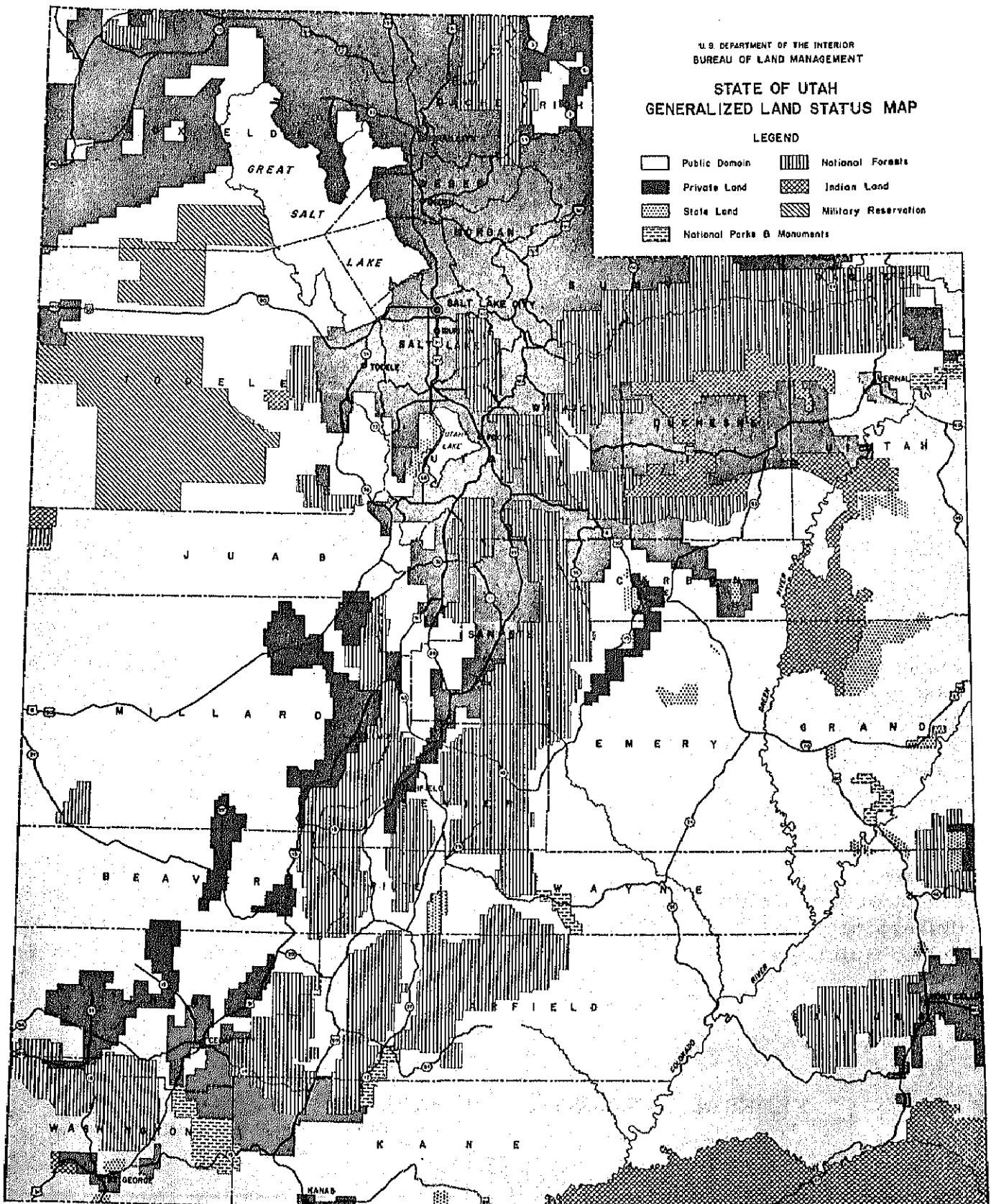
LAND OWNERSHIP

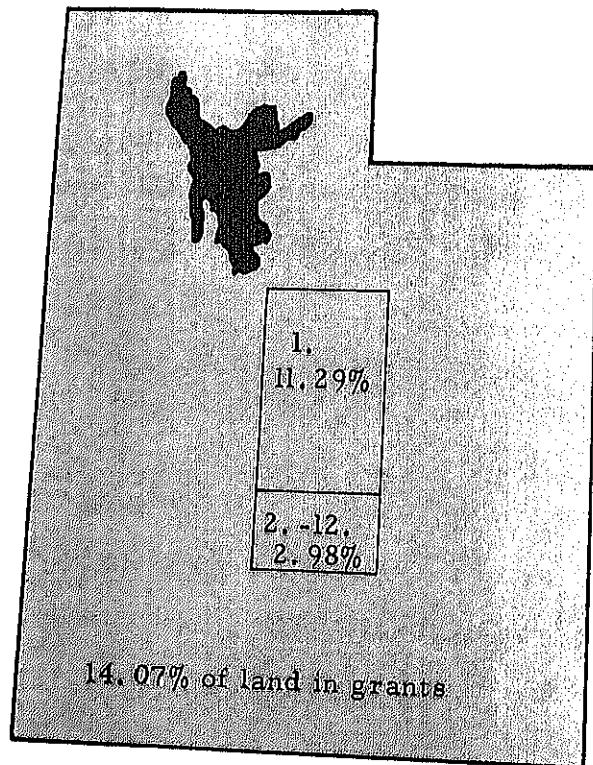
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

STATE OF UTAH
GENERALIZED LAND STATUS MAP

LEGEND

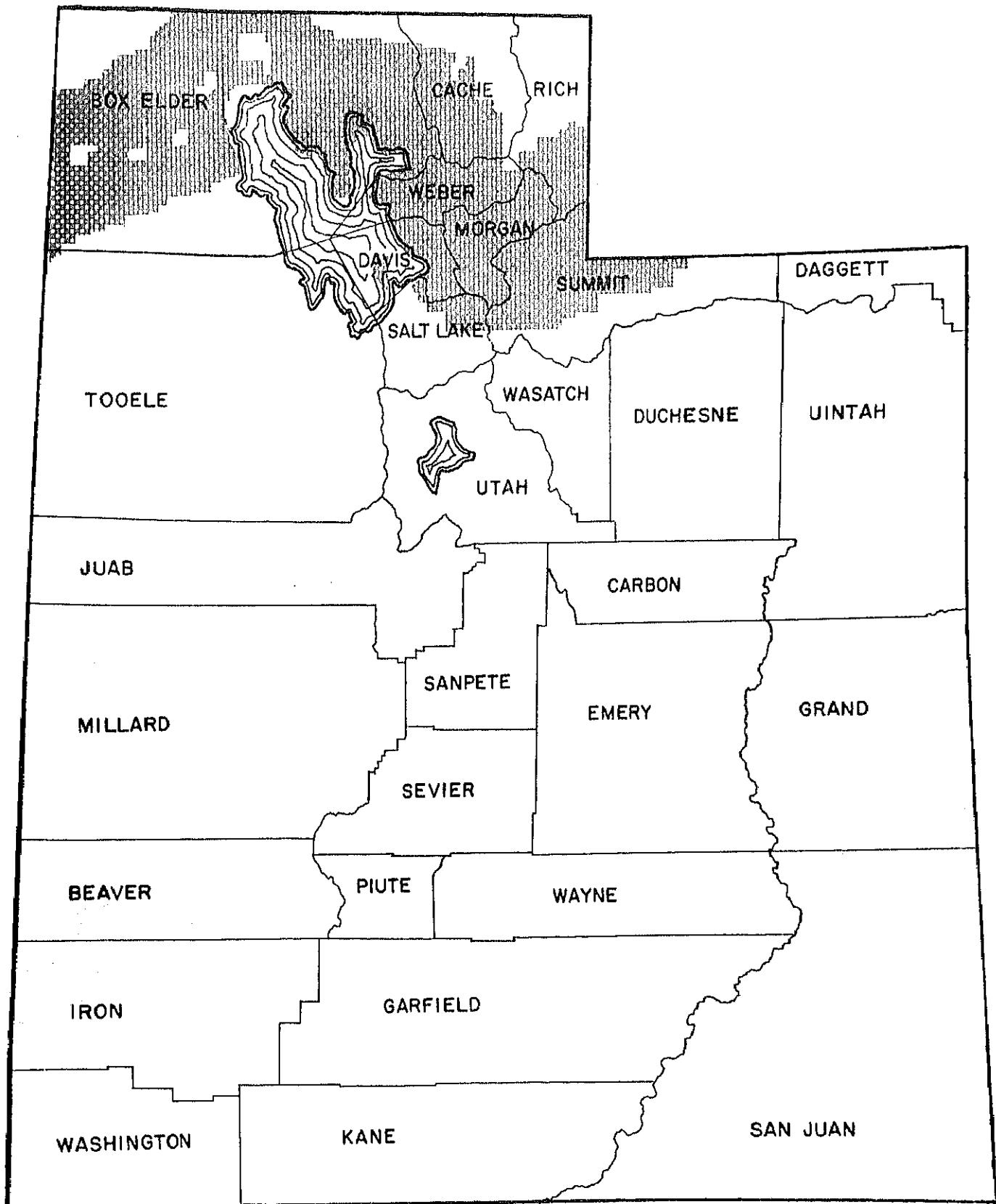
Public Domain	National Forests
Private Land	Indian Land
State Land	Military Reservation
National Parks & Monuments	





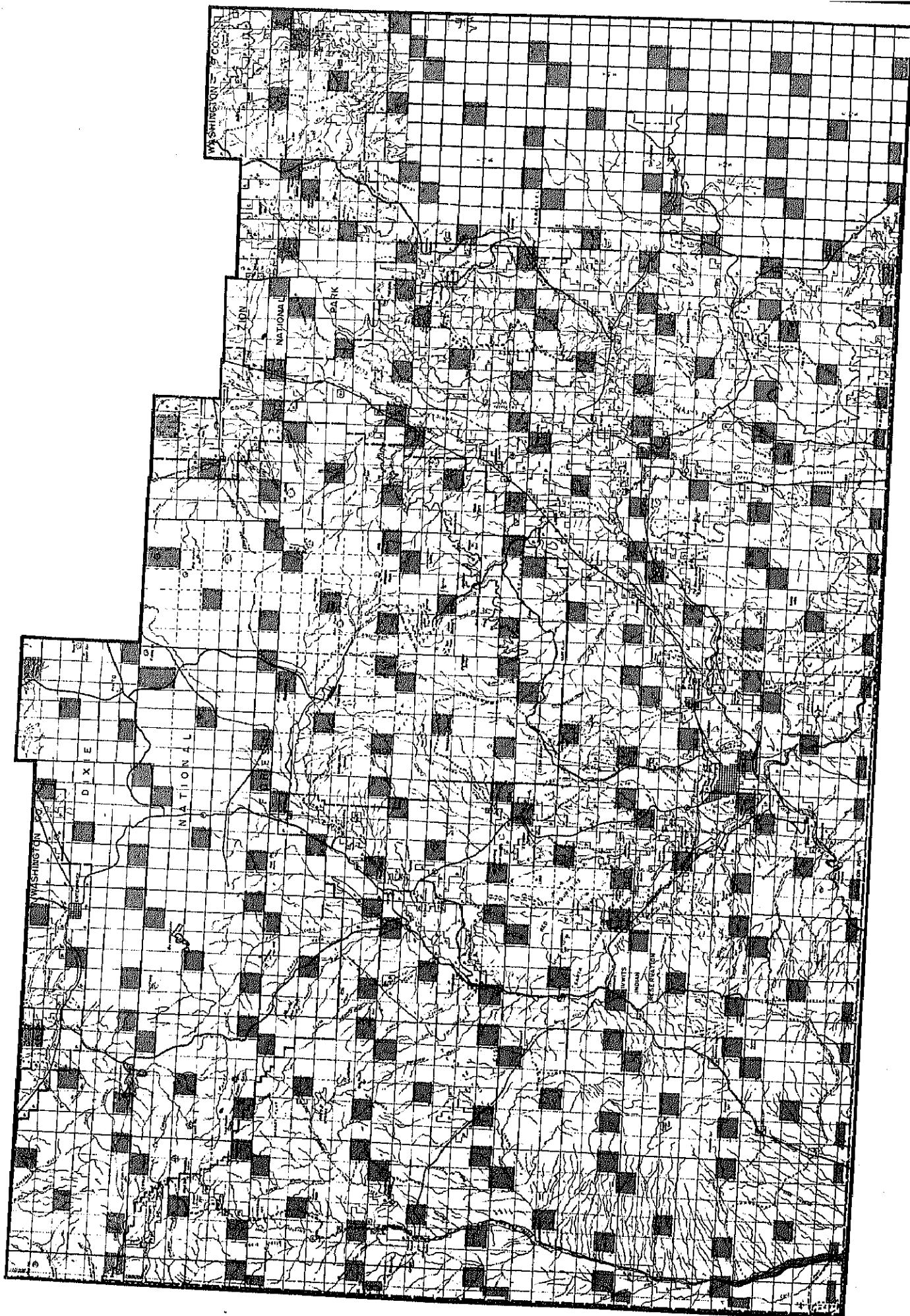
1. Schools (4 sections each township)	5,946,880 acres (approximate)
2. Reservoirs	500,000 acres
3. Agricultural College	200,000 acres
4. Deaf & Dumb Asylum	100,000 acres
5. Insane Asylum	100,000 acres
6. Institution for the Blind	100,000 acres
7. Miners' Hospital	100,000 acres
8. Normal School	100,000 acres
9. Reform School	100,000 acres
10. School of Mines	100,000 acres
11. University	100,000 acres
12. Public Buildings	64,000 acres

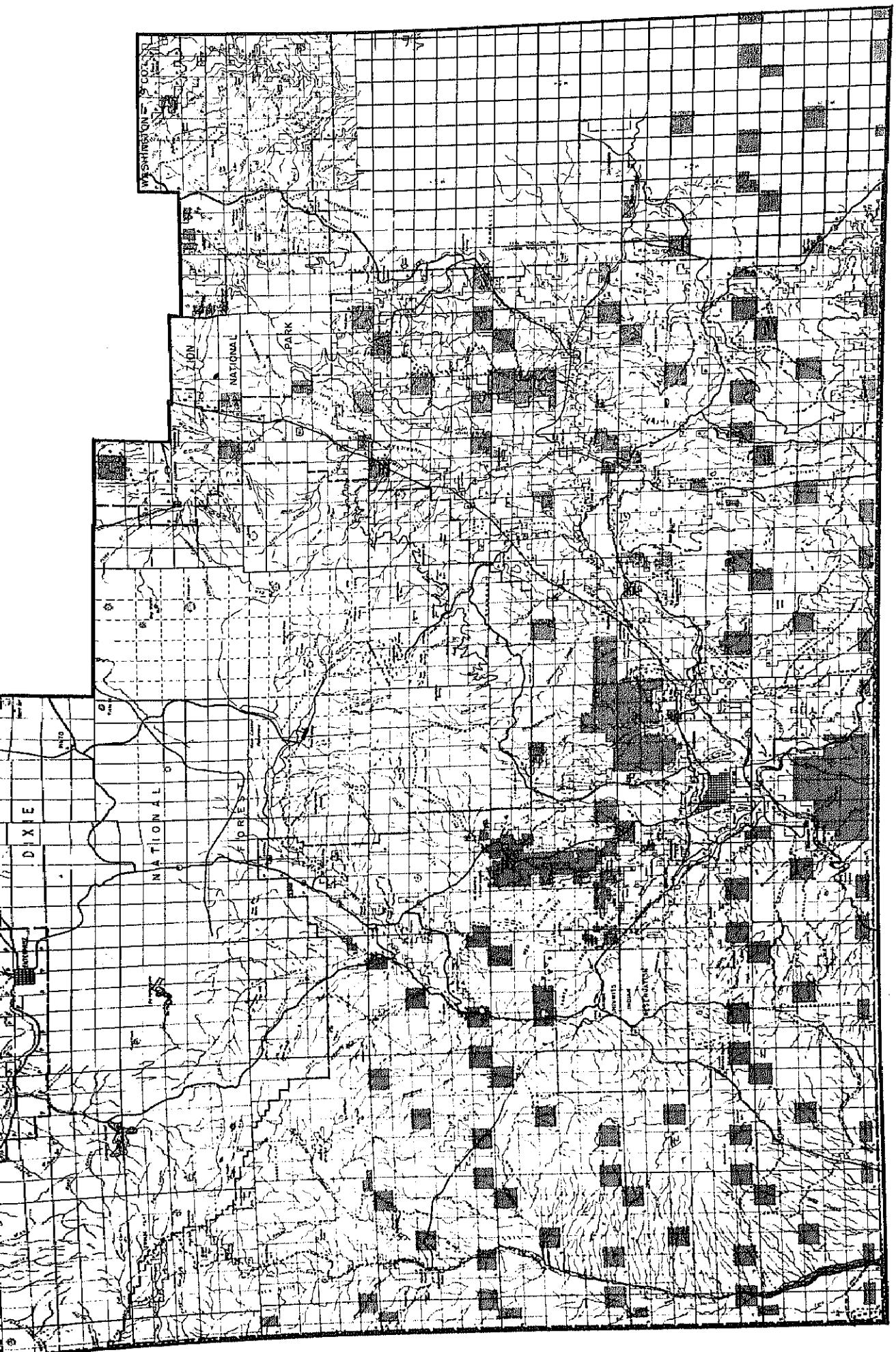
FEDERAL LAND GRANTS TO STATE OF UTAH



FEDERAL RAILROAD GRANTS

Total: 2,091,520 Acres

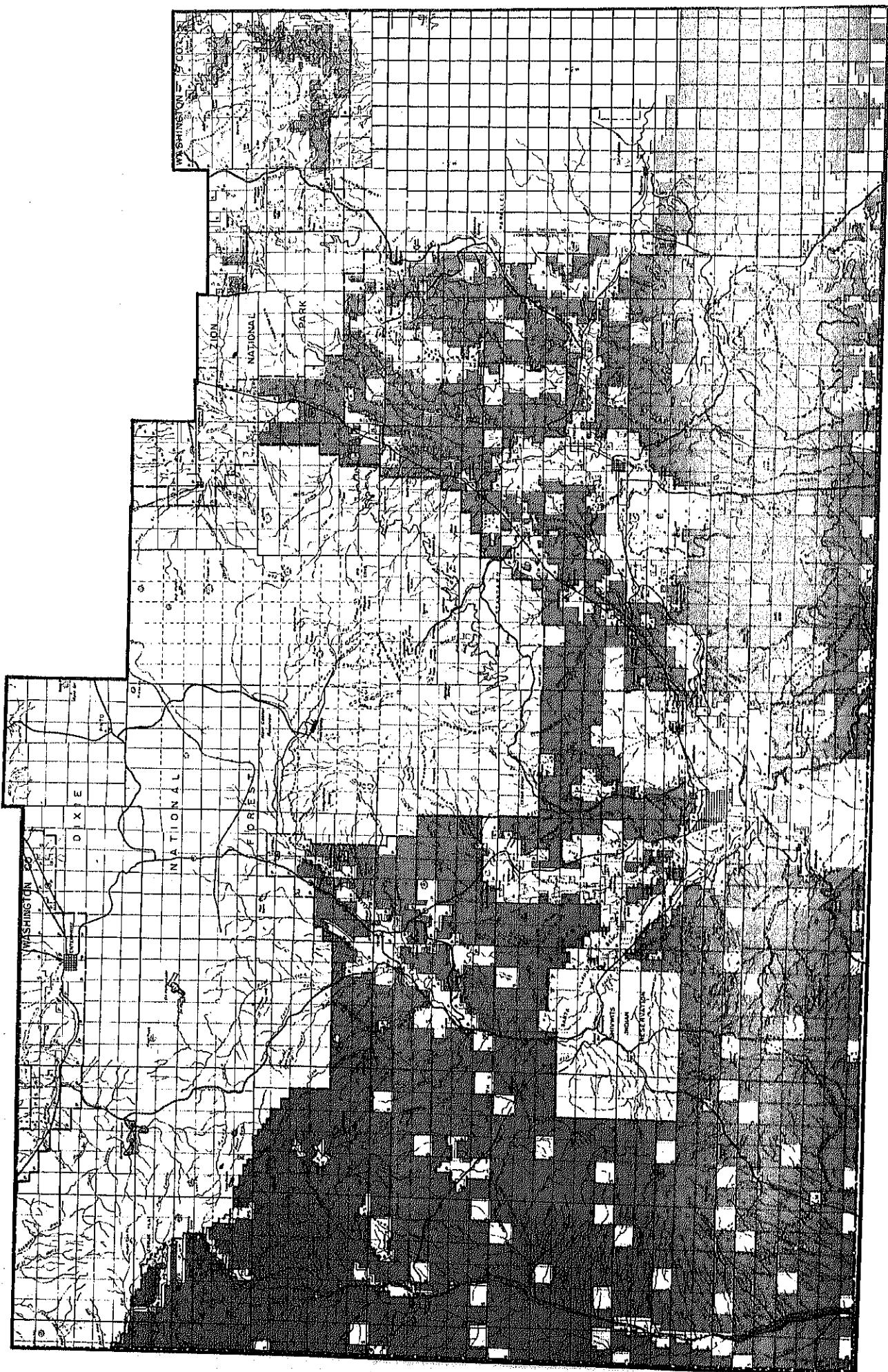




Washington County

LAND IN STATE OWNERSHIP
1965

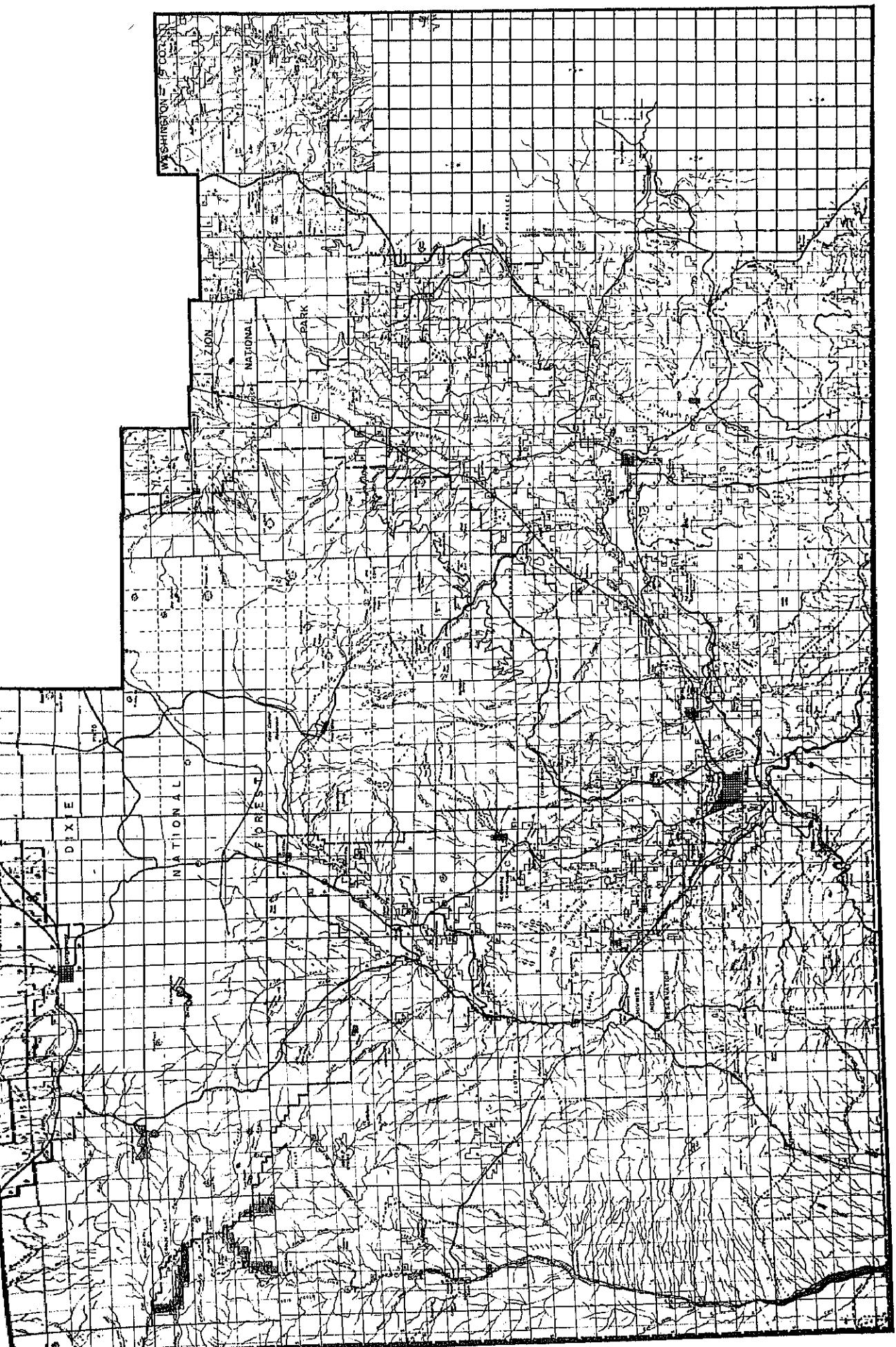
scale in miles

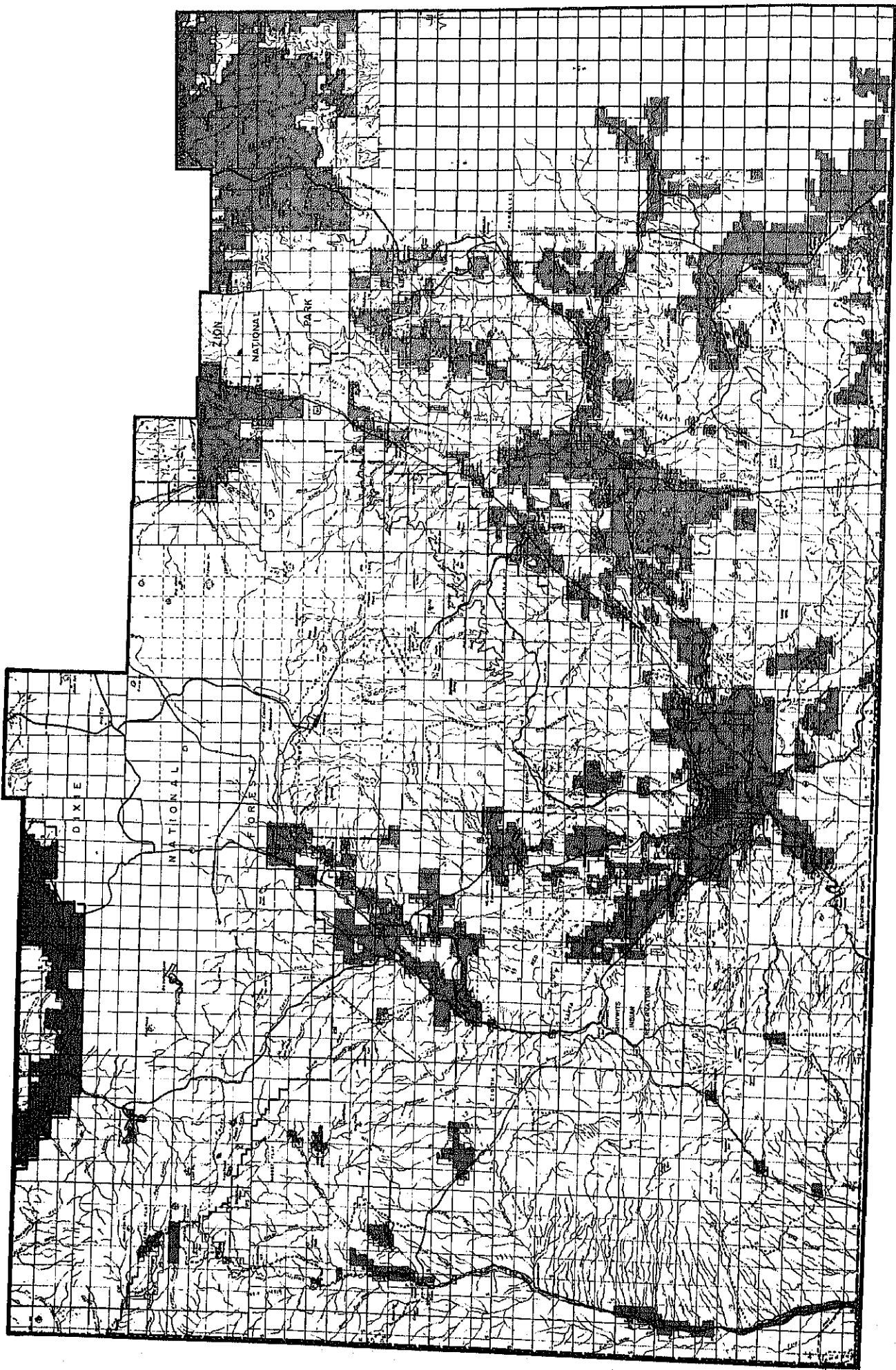


PUBLIC WATER RESERVES - 1965

Washington County

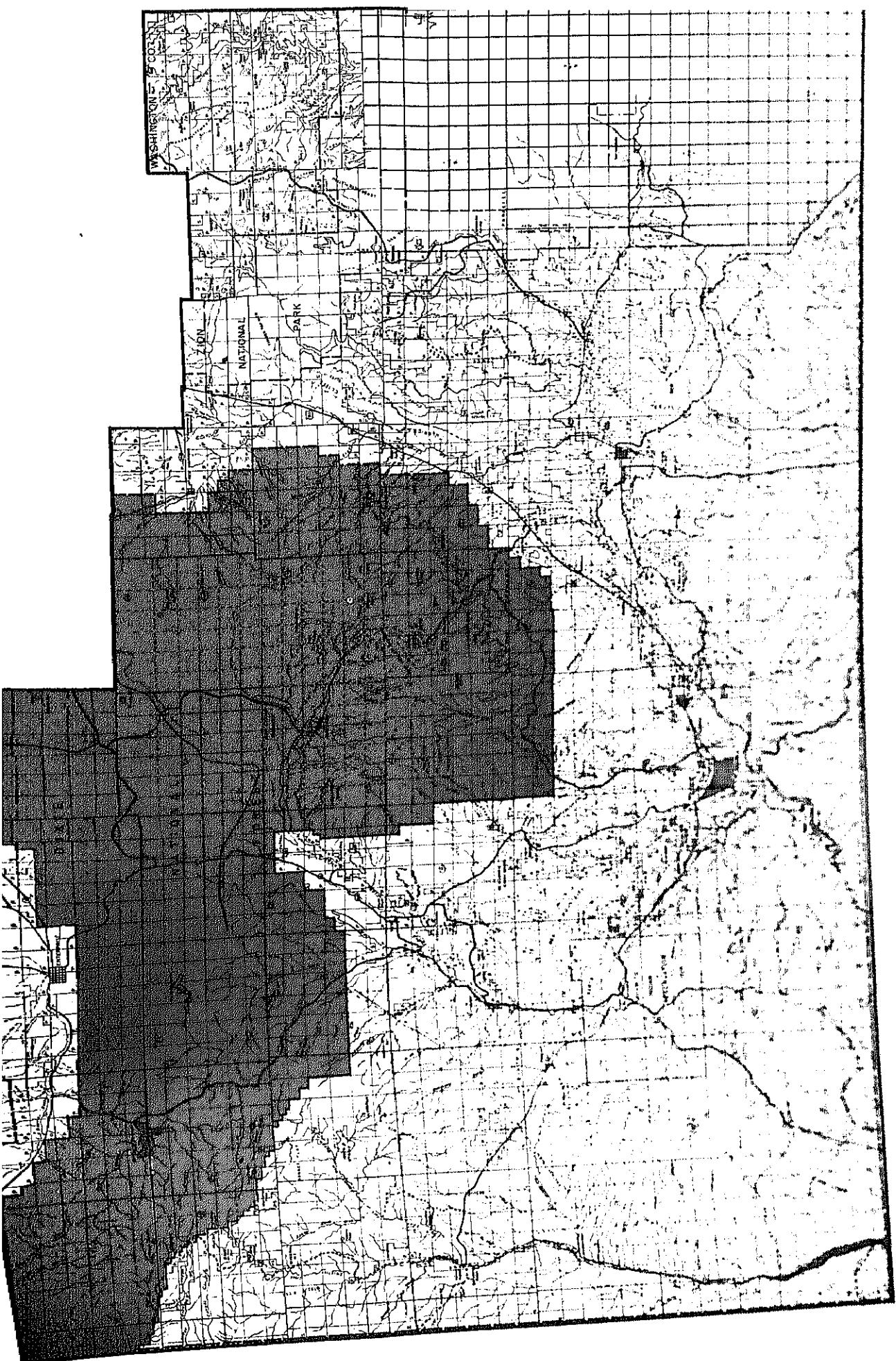
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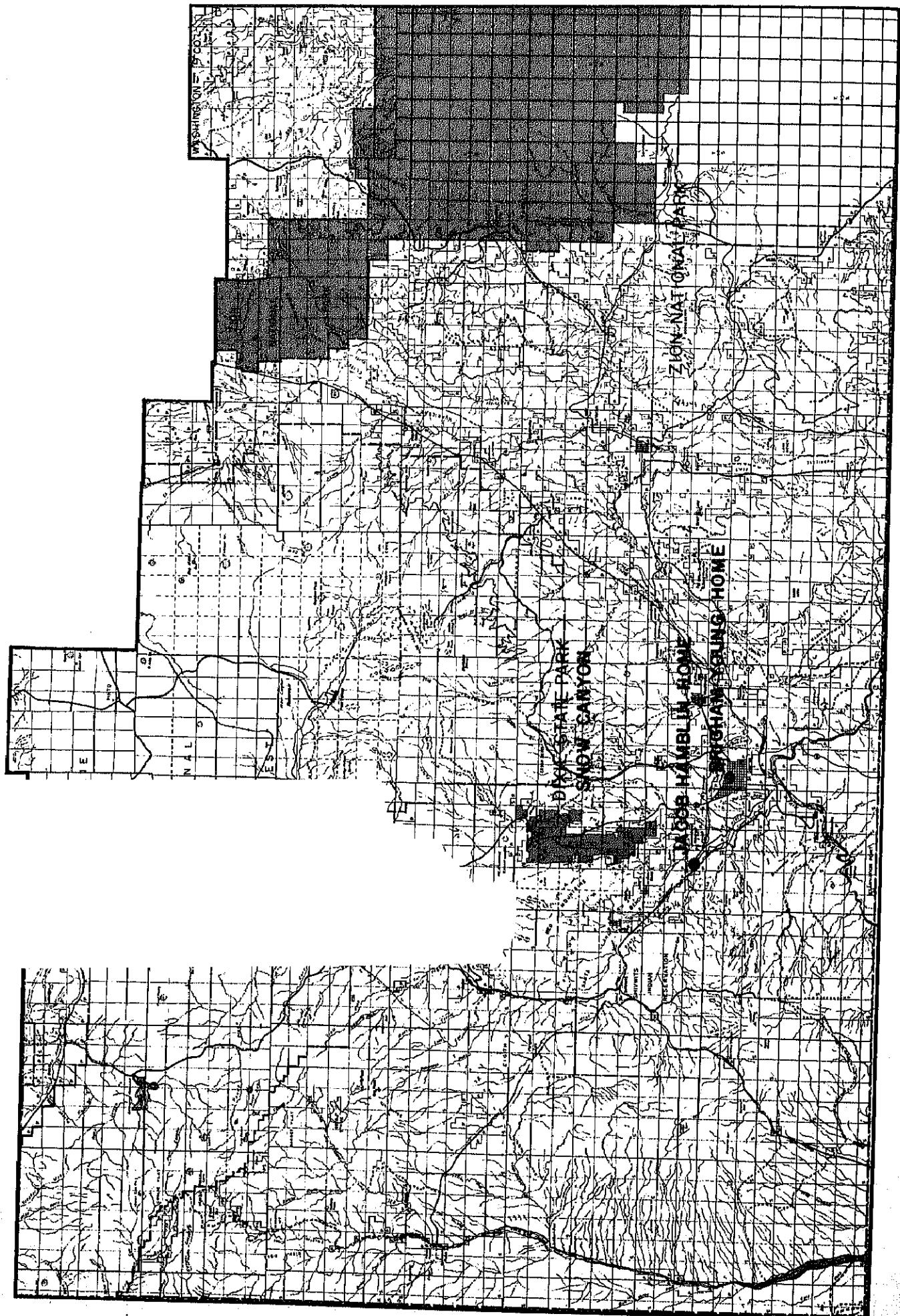
Washington County
scale in miles

LAND IN PRIVATE OWNERSHIP



Washington County

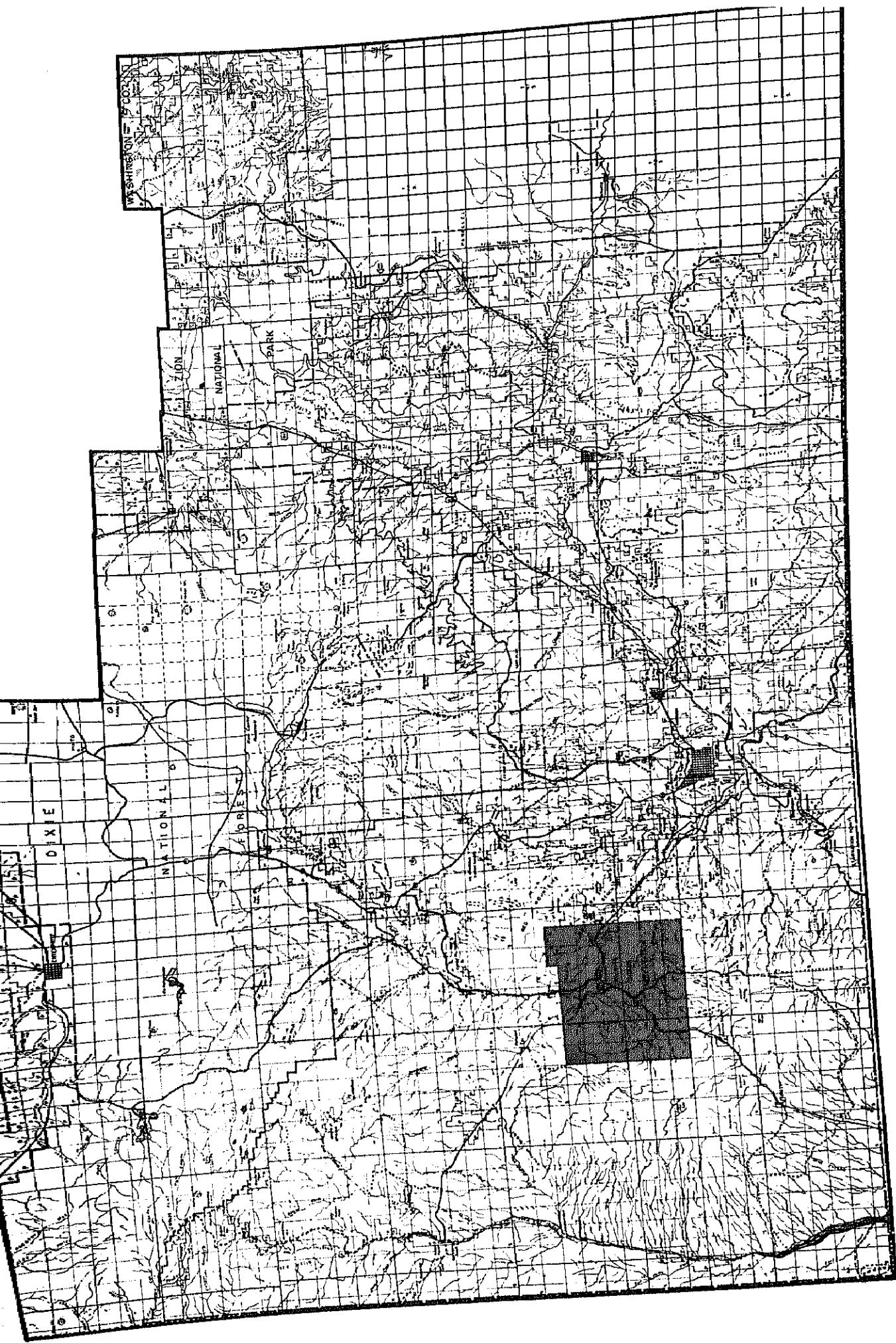
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Washington County

scale in miles

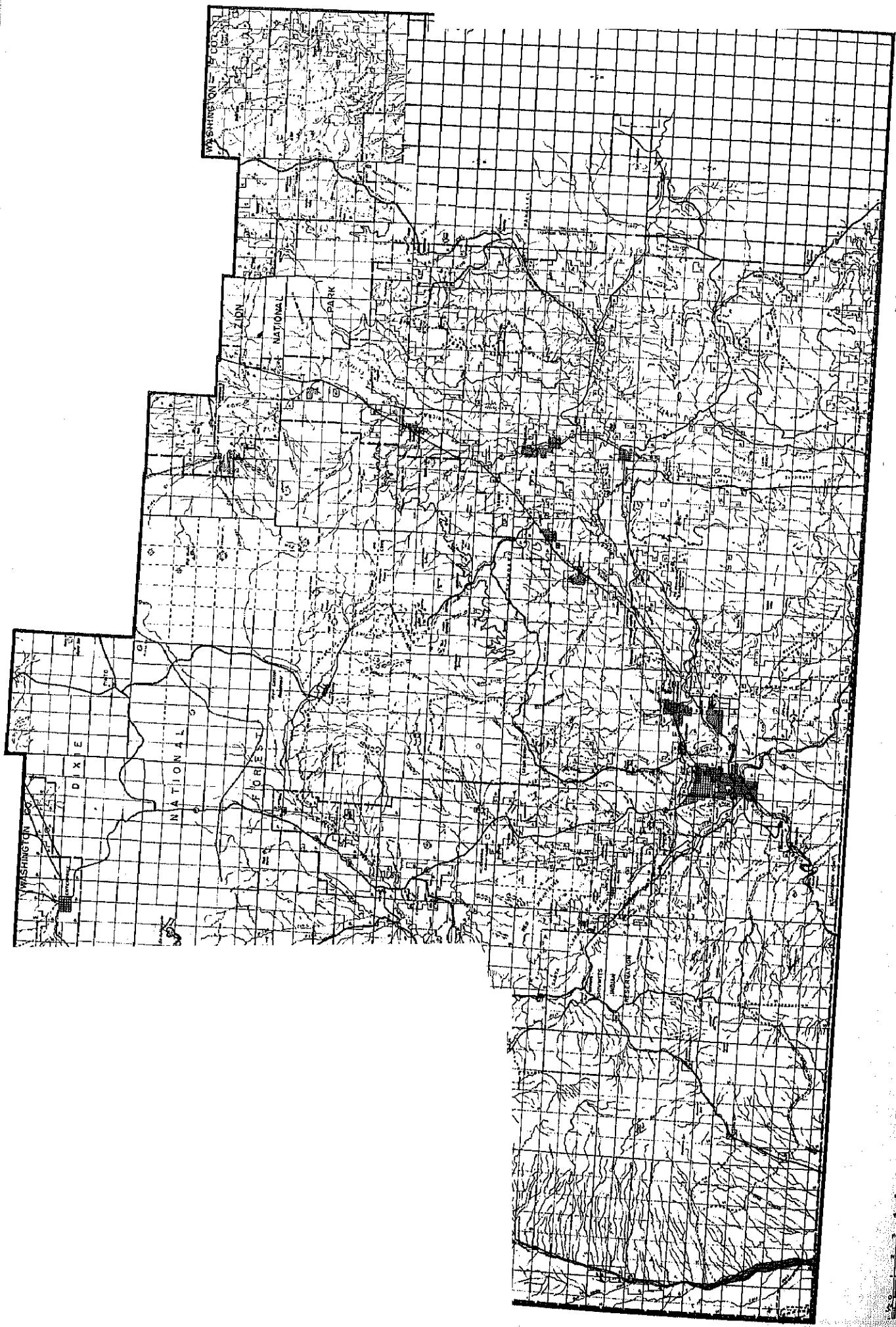
NATIONAL AND STATE PARKS



INDIAN LANDS
Shiwits Reservation

Washington

1 1/2 0 1 2 3 4 5 6 7

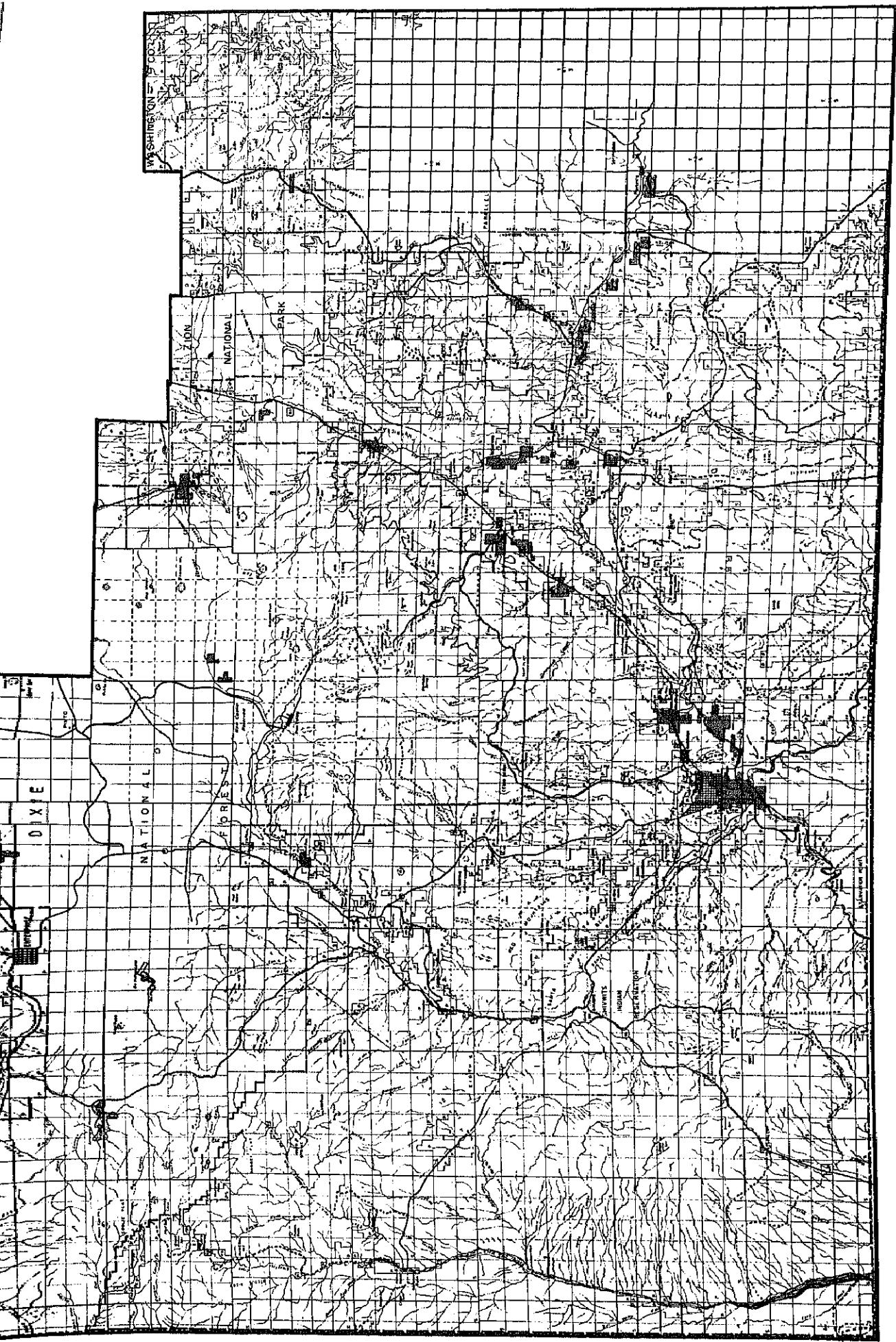


Washington County

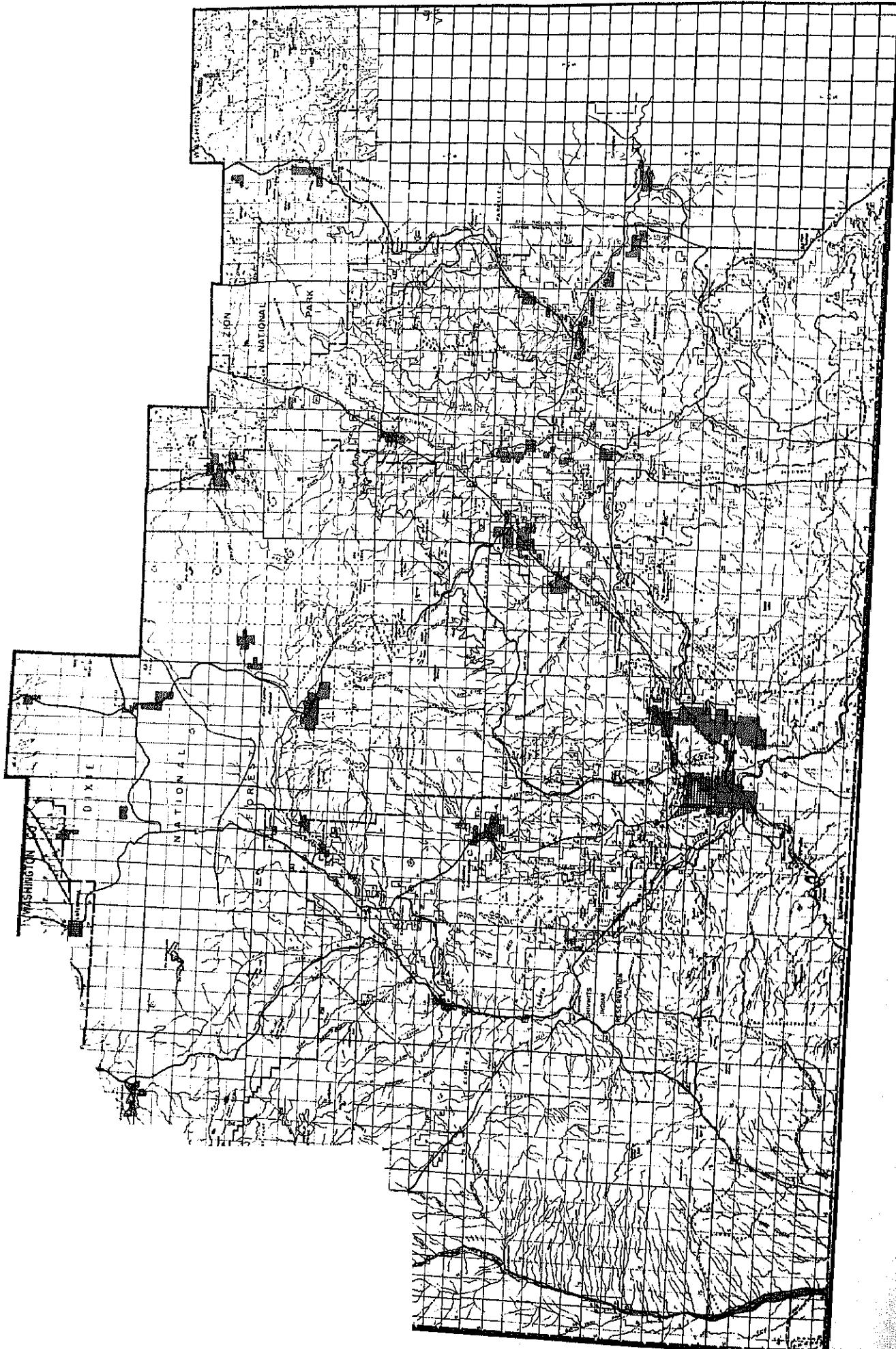
1870-1879

PRIVATE SALES AND RELEASES
OF PUBLIC LANDS

scale in miles

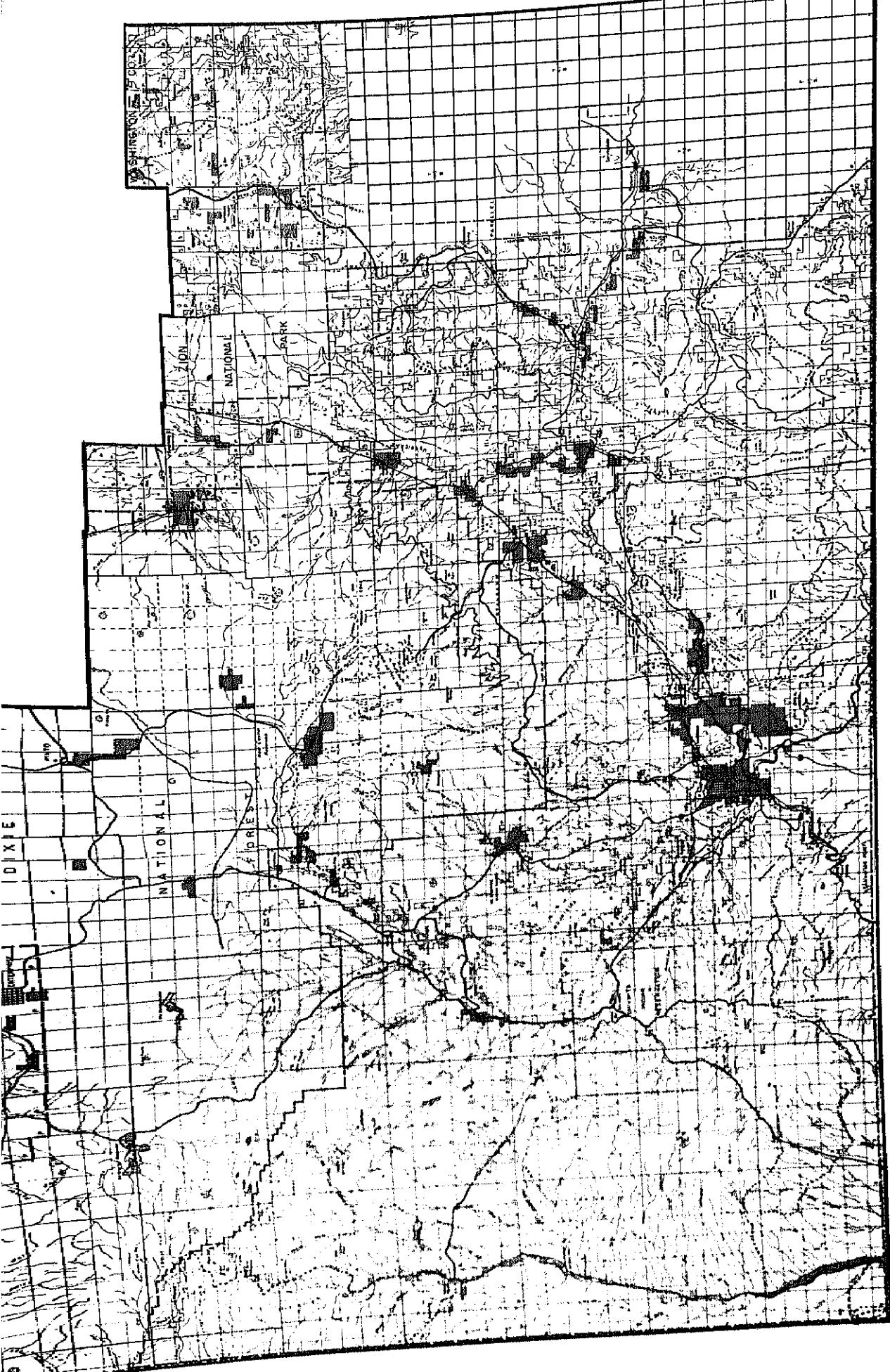


Washington County



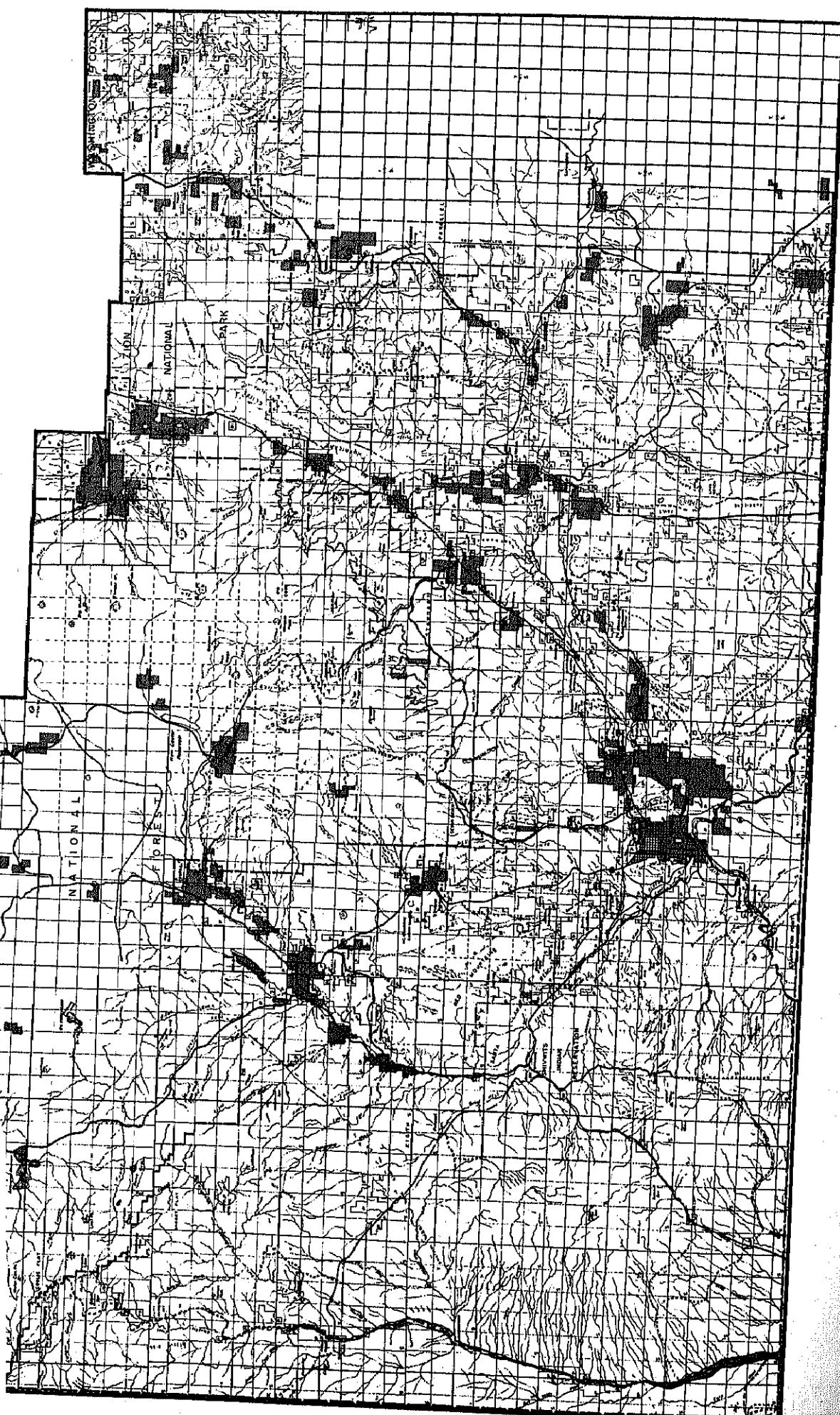
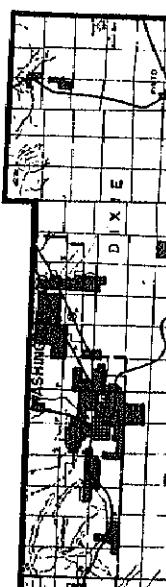
Washington County

1870-1899



Washington County

1870-1909



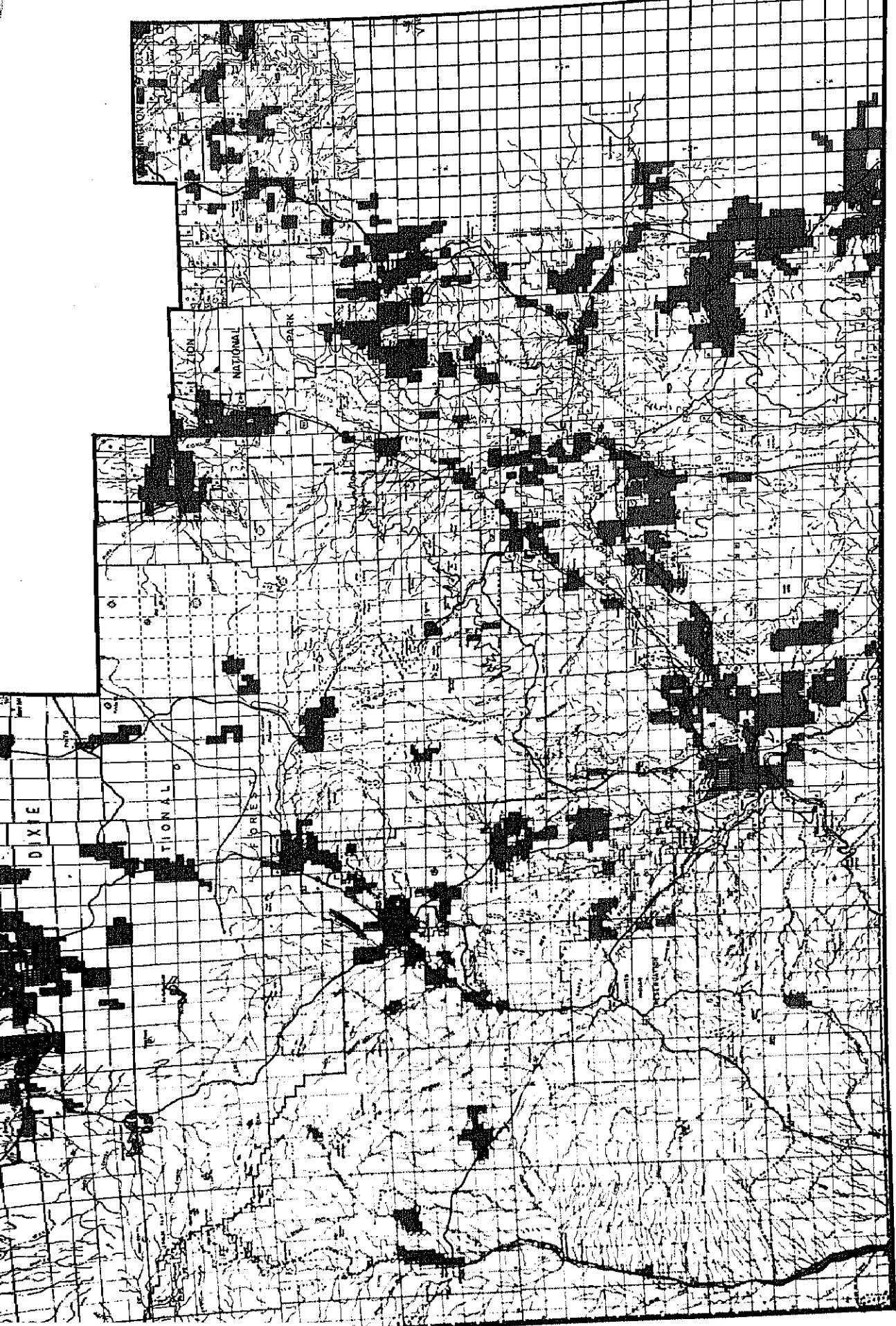
Washington County

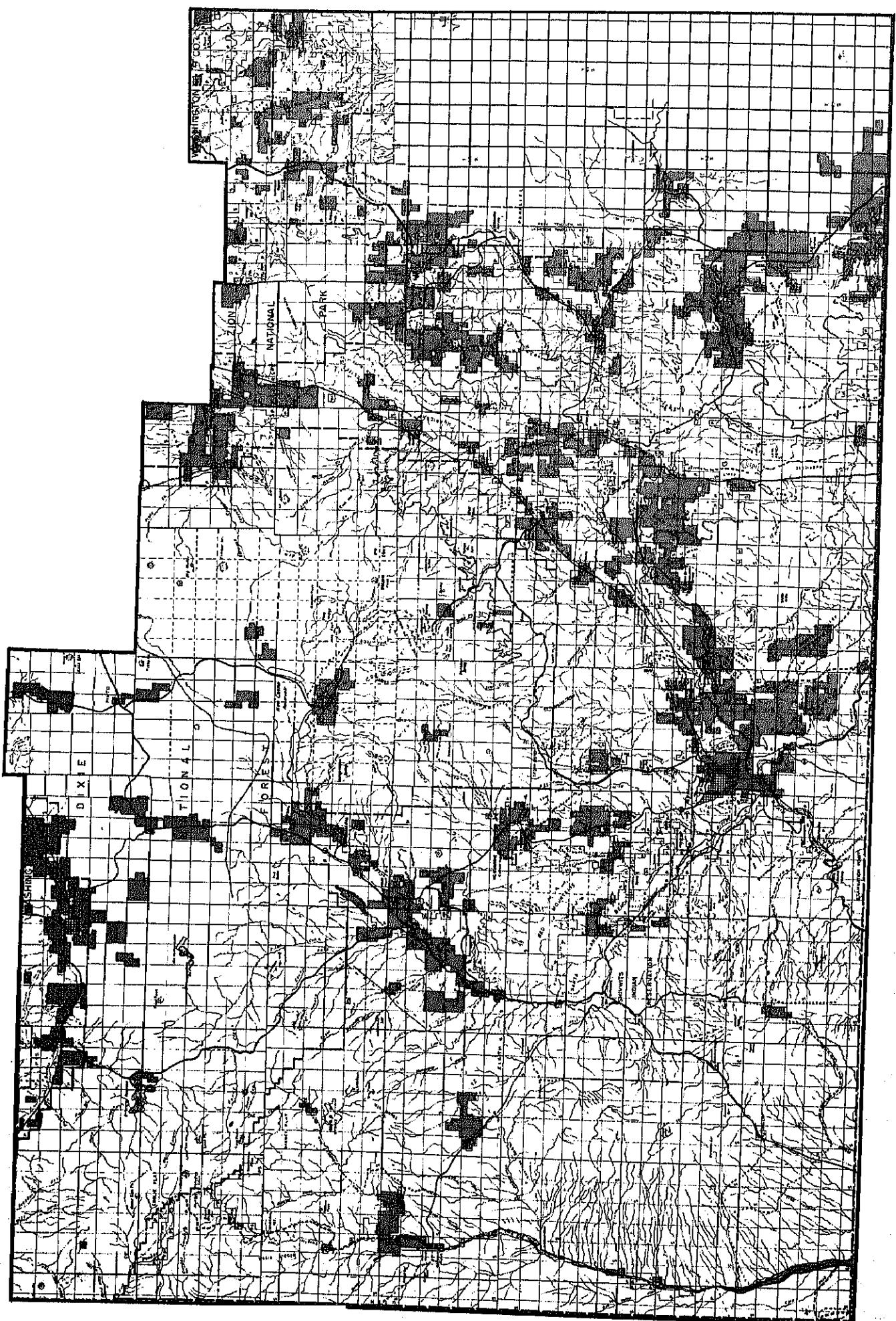
Scale in miles

Washington County

scale in miles

1870-1929

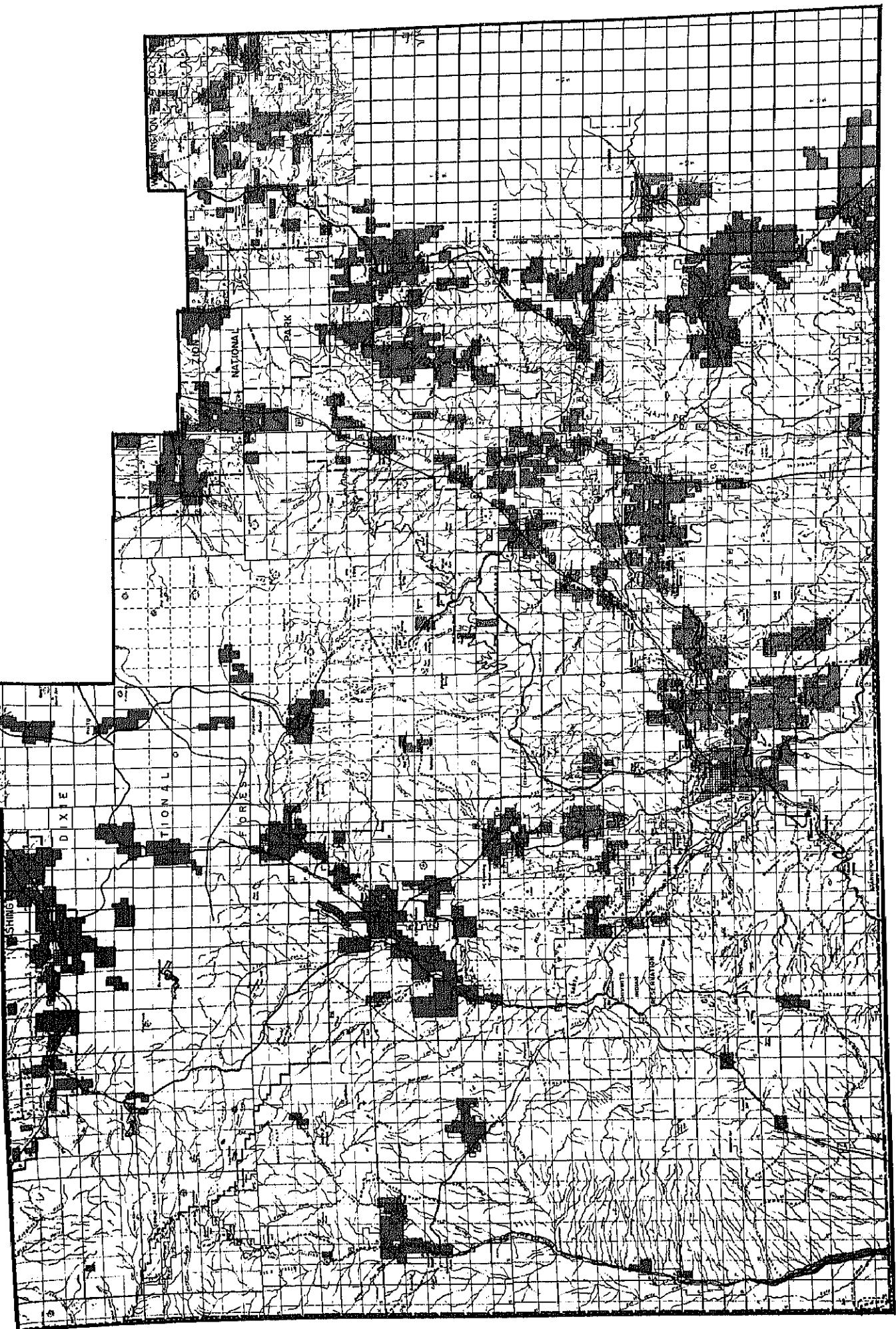




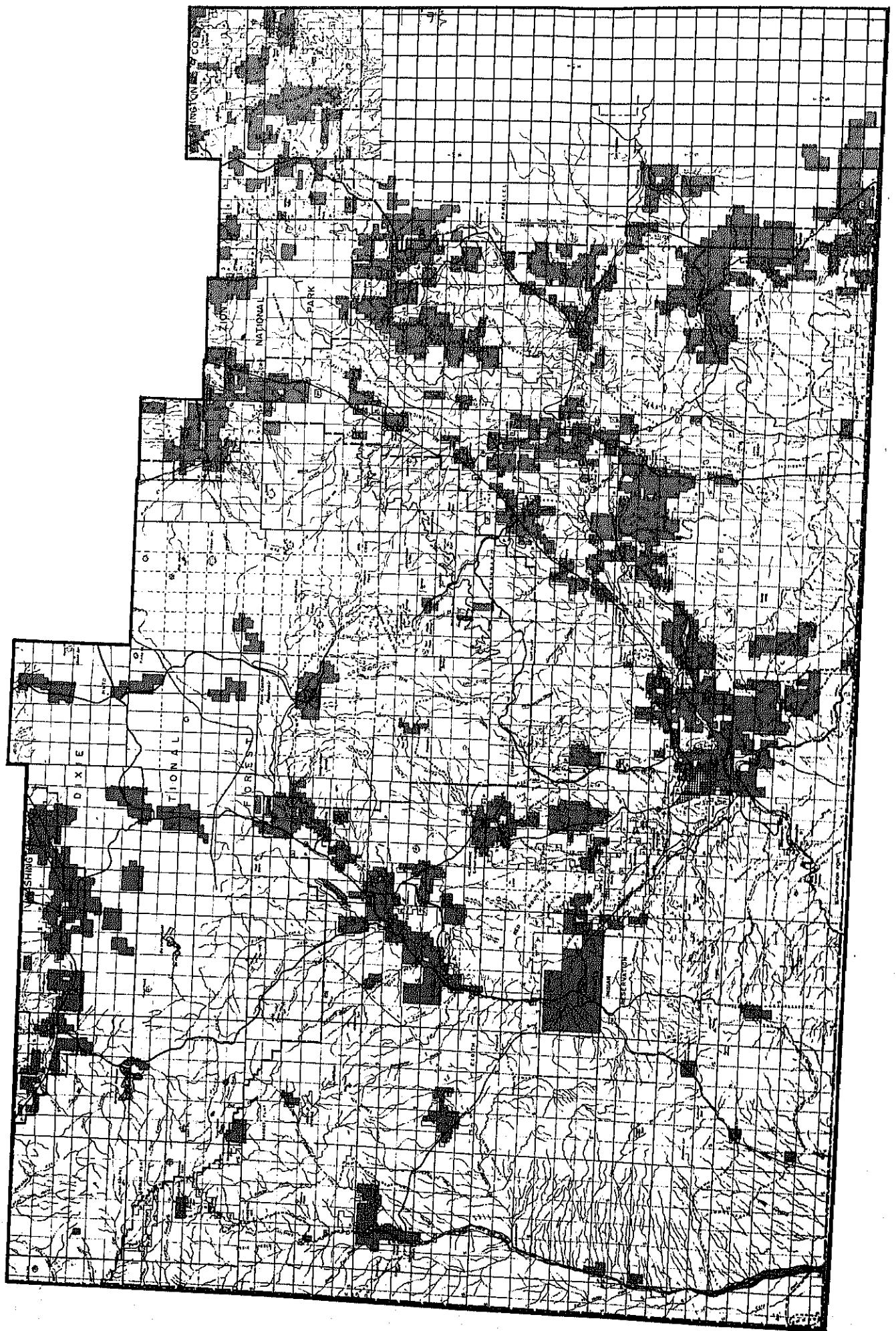
Washington County

scale in miles

1870-1939

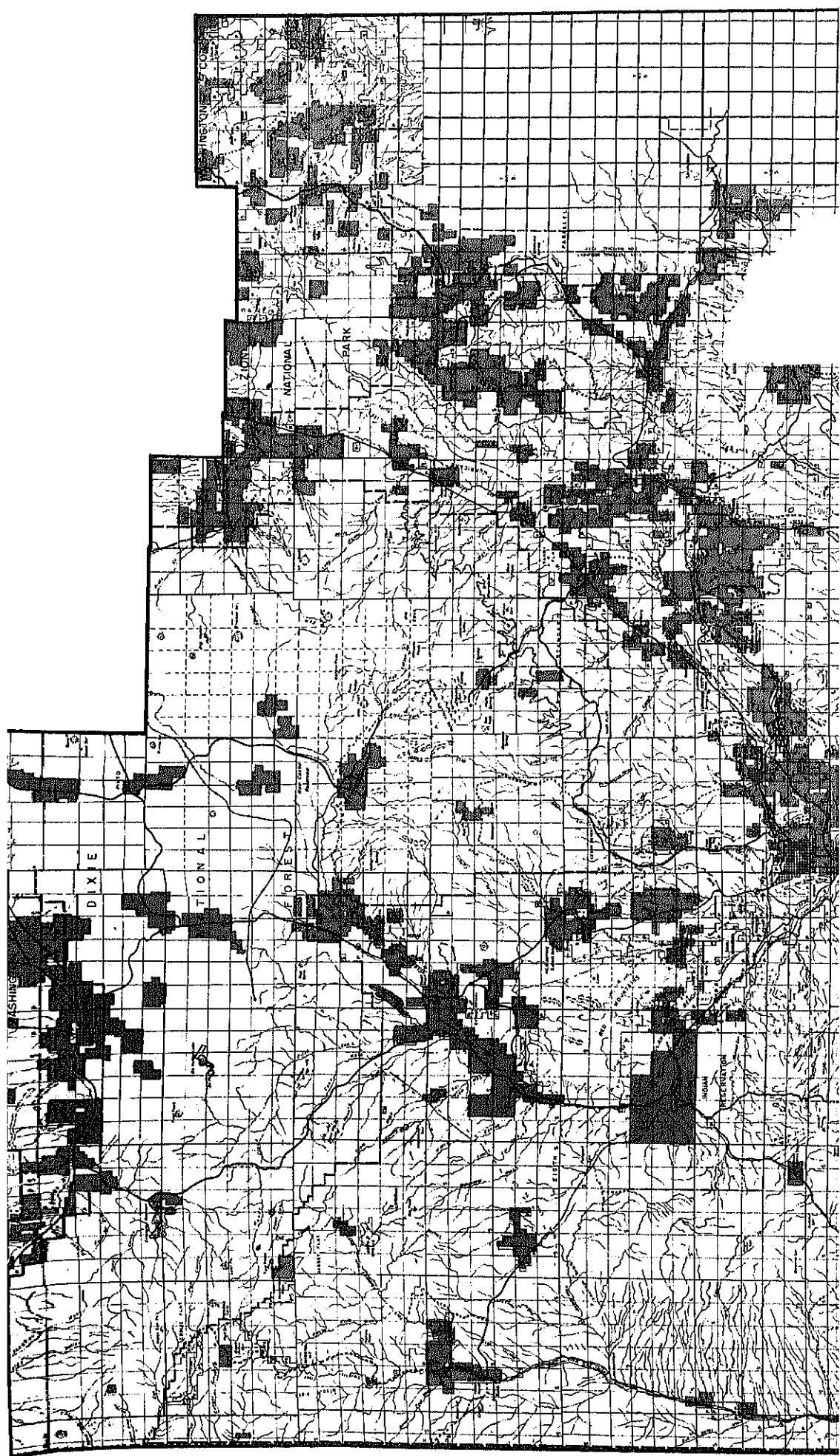


1870-1949



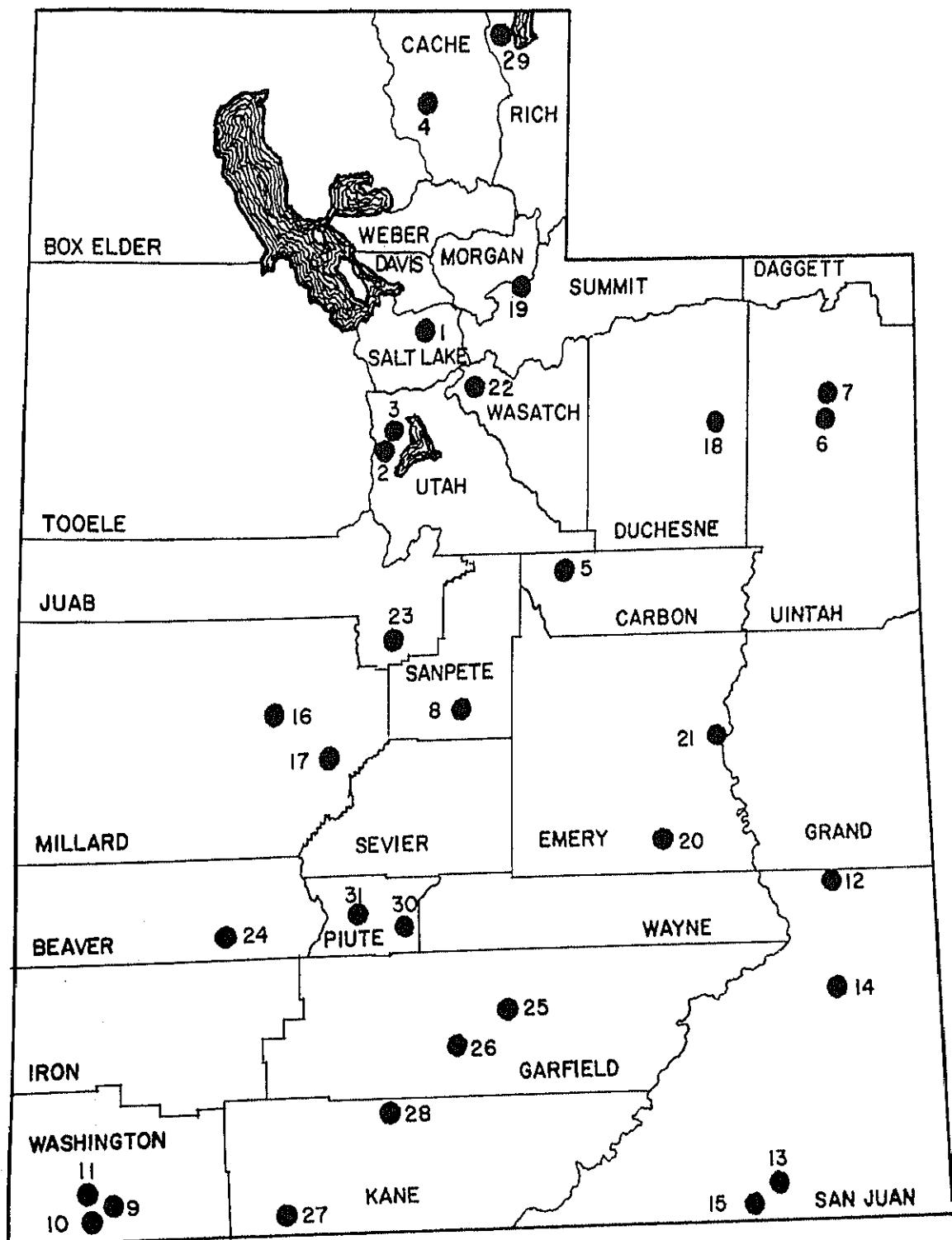
Washington County

Scale in miles



Appendix E

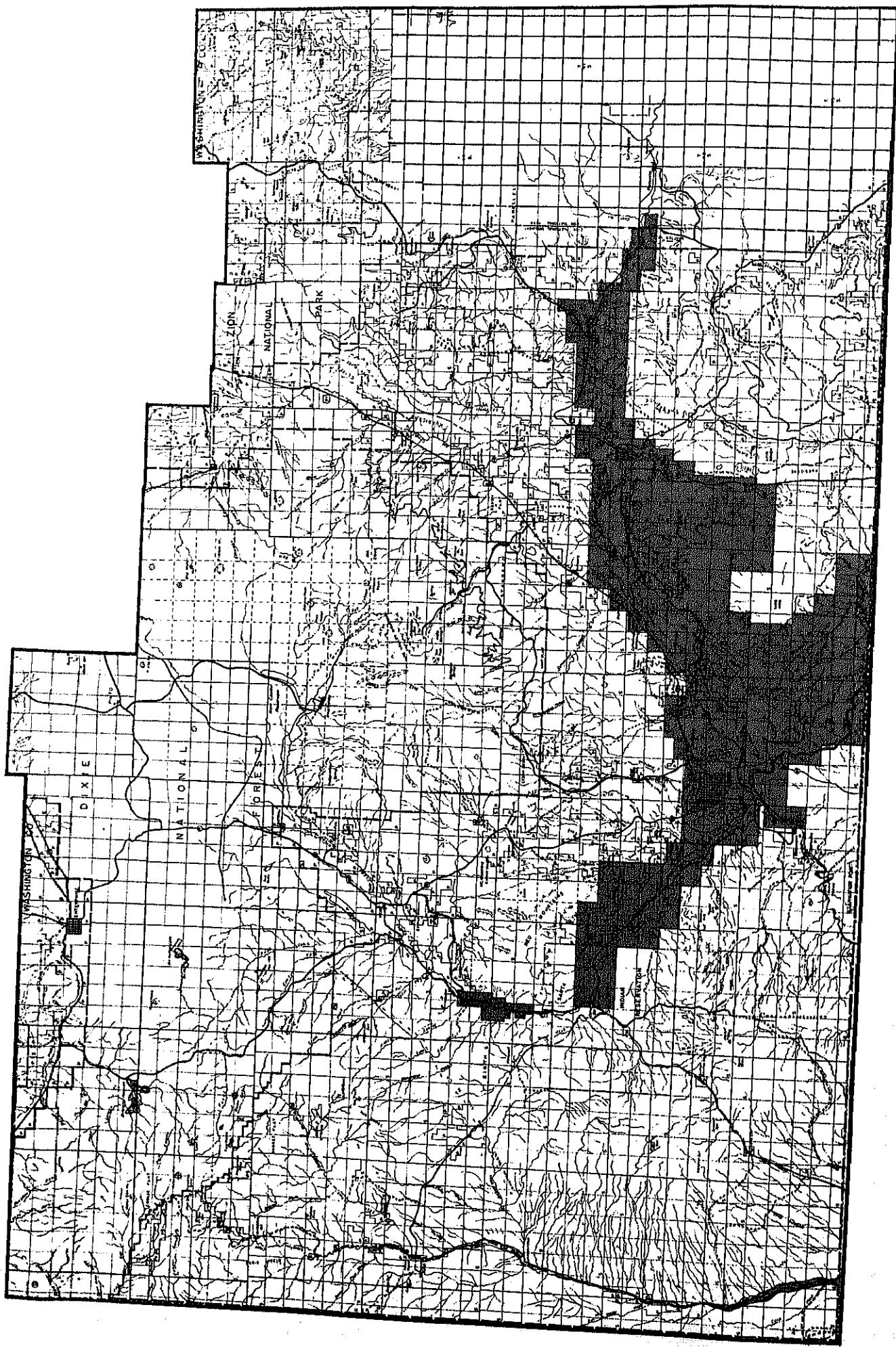
PLANNING DATA



DISTRIBUTION OF STATE PARKS

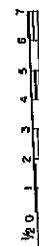
PROPOSED DIXIE RECLAMATION PROJECT

Washington County
scale in miles

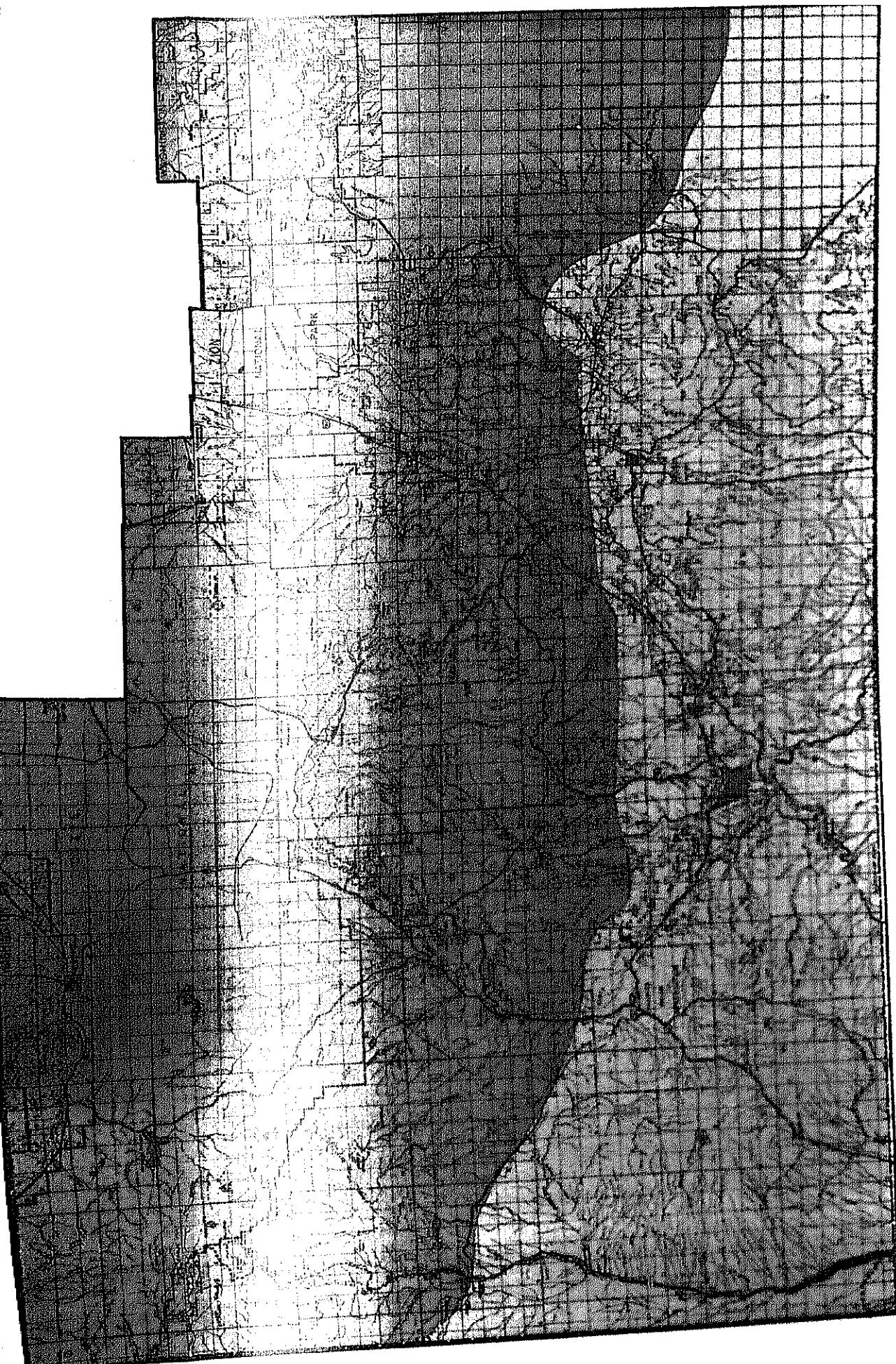


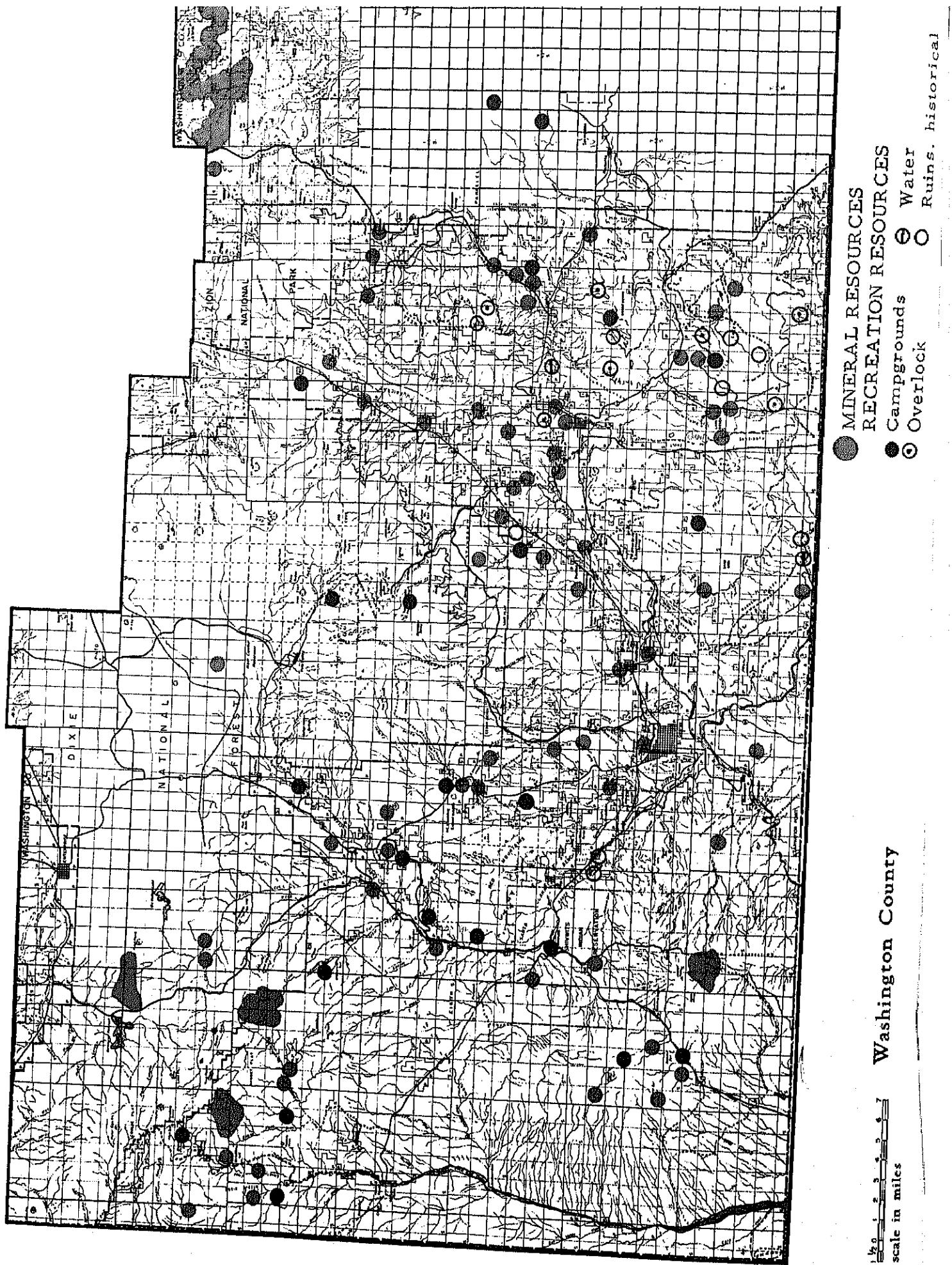
WATERSHED AREAS
● PRIMARY
○ SECONDARY

Washington Co.



scale in miles





Appendix F

TABLES

Table 7—Incorporated Areas by County: State of Utah

	Acres	Percent
Salt Lake	66,214.40	13.54
Weber	21,049.60	5.99
Utah	53,971.20	4.22
Davis	30,553.60	17.81
Cache	48,960.00	6.51
Box Elder	99,699.20	2.78
Carbon	10,963.20	1.16
Tooele	63,264.00	1.43
Uintah	1,824.00	0.06
Sanpete	12,486.40	1.22
Iron	4,883.20	0.23
Sevier	4,384.00	0.68
Washington	24,108.80	1.55
San Juan	928.00	0.02
Millard	7,904.00	0.19
Duchesne	2,636.80	0.13
Grand	1,382.40	0.06
Summit	6,656.00	0.56
Emery	4,608.00	0.16
Wasatch	4,473.60	0.59
Juab	3,008.00	0.14
Beaver	1,587.20	0.10
Garfield	22,208.00	0.95
Morgan	1,817.60	0.47
Kane	1,478.40	0.06
Wayne	1,075.20	0.07
Rich	1,900.80	0.29
Piute	30,579.20	6.35
Daggett	460.80	0.10
TOTALS		1.02 of State

Table 8—Population and Density: Washington County

City	Population 1960	Incorporated Area Sq. Miles	Density Persons Sq. Mile
Central	21	4.13	5.08
Enterprise	859	1.02	842.16
Hurricane	1,251	1.98	631.82
Ivins	77	0.38	202.63
La Verkin	365	3.00	121.67
Leeds	109	0.80	136.25
New Harmony	105	0.14	714.29
Santa Clara	291	1.38	210.87
Springdale	248	4.00	62.00
St. George	5,130	8.13	631.00
Toquerville	197	8.75	22.51
Virgin	124	0.81	153.09
Washington	445	3.15	141.27
Rural County	1,049	2,395.97	0.44
County Total	10,271	2,433.64	4.22

Table 9—Population—1890–1960: Washington County

	1890	1900	1910	1930	1940	1950	1960
*Bloomington	63	75	50	10			
Central			110	74	70	58	21
Enterprise	41	100	350	548	677	808	859
Grafton	104	98	106	23			
Gunlock	92	100	112	139	105	89	
Harmony	102	119	105	169	197	134	105
Hurricane			366	1,209	1,524	1,370	1,251
Ivins					83	95	77
La Verkin			120	236	356	387	365
Leeds	223	248	148	220	268	160	109
Montaqua				59			
Pine Valley	253	251	118	49	33	16	
Pinto	108	100	89	7			
Rockville	194	214	189	251	307	453	
St. George	1,377	1,600	1,769	2,499	3,683	4,683	5,130
Santa Clara	202	358	390	378	367	393	291
Springdale	73	144	186	351	454	174	248
Toquerville	260	307	314	339	323	280	197
Veyo				167	114	84	
Virgin	213	269	136	202	154	154	124
Washington	315	529	465	490	554	498	414
Rural County		100					1,080
County Total		4,612	5,123	7,420	9,269	9,836	10,271

*Variation in districts results from variation in reporting by the Bureau of Census.

Table 10—Population Change—1900–1960: Washington County

City	% Change 1900–1910	% Change 1930–1940	% Change 1940–1950	% Change 1950–1960	% Change
Central	0	—5.4	—17.1	—63.7	—80.9*
Enterprise	+250.0	+23.5	+19.4	+6.3	+759.0
Hurricane	0	26.1	—10.1	—8.7	+241.8*
Ivins	0	0	+14.5	—18.9	—7.2**
LaVerkin	0	+50.8	+8.7	—5.7	+204.2*
Leeds	—40.3	+21.8	—40.3	—31.9	—46.0
New Harmony	—11.8	16.7	—32.0	—21.6	—16.7
Santa Clara	+8.9	—2.9	+7.1	—26.0	—18.7
Springdale	+29.2	+29.3	—61.7	+42.5	+72.2
St. George	+10.7	+47.4	+27.2	+9.5	+220.6
Toquerville	2.3	—4.7	—13.3	—29.6	—35.8
Virgin	—49.4	—23.3	0.0	—19.5	—53.9
Washington	—12.1	+13.1	—10.1	—16.9	—21.7
Rural County	0	0	0	0	0
County	+13.5	+24.9	+6.1	+4.4	+127.6

*1910–1900

** 1940–1960

Table 11—Land Selections and Sales by the Utah State Land Board: State of Utah
(In Acres)

Year	Selection	Cumulative Selections	Sold	Cumulative Sales
1896	0.00	0.00	0.00	0.00
1897	67,278.78	67,278.78	1,642.69	1,642.69
1898	60,944.00	128,222.78	79,067.03	80,709.72
1899	127,695.52	255,918.30	104,217.59	184,927.31
1900	215,542.96	471,461.26	284,190.67	469,117.98
1901	193,675.65	665,136.91	191,769.20	660,887.18
1902	321,229.75	986,366.66	364,156.87	1,025,044.05
1903	140,949.94	1,127,316.0	240,689.56	1,265,733.61
1904	134,289.90	1,261,606.50	207,672.89	1,473,406.50
1905	15,441.92	1,277,048.42	43,011.39	1,516,417.89
1906	0.00	1,277,048.42	50,957.33	1,567,375.22
1907	141,322.11	1418,370.53	222,093.99	1,789,469.21
1908	218,813.46	1,637,183.99	264,489.72	2,053,958.93
1909	143,805.75	1,780,989.74	236,811.15	2,290,770.08
1910	288,606.95	2,069,596.69	376,874.47	2,667,644.55
1911	127,545.11	2,197,141.80	163,414.92	2,831,059.47
1912	43,536.12	2,240,677.92	105,988.73	2,937,048.20
1913	95,422.90	2,336,100.82	130,191.09	3,067,239.29
1914	7 958.93	2,344,059.75	141,392.35	3,208,631.64
1915			54,875.88	3,263,507.52
1916			33,544.82	3,297,052.34
1917	18,001.24	*2,362,060.99	45,913.11	3,342,965.45
1918	16,575.08	2,378,636.07	45,830.21	3,388,795.66
1919	22,237.81	2,400,873.88	102,537.40	3,491,333.06
1920	16,465.75	2,417,339.63	108,846.05	3,600,179.11
1921	13,133.13	2,430,472.76	107,878.91	3,708,058.02
1922	26,788.36	2,457,261.12	41,750.38	3,749,808.40
1923	63,056.26	2,520,317.38	44,620.34	3,794,428.74
1924	22,694.69	2,543,012.07	99,473.32	3,893,902.06
1925	11,719.09	2,554,731.16	38,908.35	3,932,810.41
1926	15,446.89	2,570,198.05	44,810.20	3,977,620.61
1927	18,481.73	2,588,679.78	51,394.11	4,029,014.72
1928	1,167.64	2,589,847.42	14,885.36	4,043,900.08
1929	13,070.30	2,602,917.72	27,718.37	4,071,618.45
1930	25,138.82	2,628,056.54	37,794.62	4,109,413.07
1931	9,063.06	2,637,119.60	15,737.45	4,125,150.52
1932	2,429.99	2,639,549.59	4,978.78	4,130,129.30
1933	3,322.72	2,642,872.31	4,736.22	4,134,865.52
1934	10,376.85	2,653,249.16	11,581.68	4,146,447.20
1935	**1,356.52	2,654,605.68	64,567.18	4,211,014.38
1936			40,548.19	4,251,652.57
1937			11,258.89	4,262,821.46
1938	28.99	2,654,634.67	23,140.73	4,285,962.19
1939			8,956.79	4,294,918.98
1940	330.03	2,654,964.70	15,397.26	4,310,316.24

* Cumulative values do not account for selections in 1915 and 1916 which were not available.

** Land Board records are based upon two-year intervals.

Table 12—Land Selections and Sales by the Utah State Land Board: Washington County
(In Acres)

Year	Selection	Cumulative Selections	Sold	Cumulative Sales
1896	0.00	0.00	0.00	0.00
1897	1,716.00	1,716.00	0.00	0.00
1898	856.80	2,572.80	1,057.10	1,057.10
1899	265.00	2,837.80	336.80	1,393.90
1900	2,134.87	4,972.67	2,952.07	4,345.97
1901	1,377.23	6,349.90	1,294.29	5,640.26
1902	5,715.76	12,065.66	6,449.94	12,088.20
1903	3,212.81	15,278.47	7,044.56	19,132.76
1904	5,488.65	20,767.12	16,725.73	35,858.49
1905	480.00	21,247.12	440.00	36,298.49
1906	0.00	21,247.12	760.00	37,058.89
1907	4,153.95	25,401.17	14,591.84	51,650.73
1908	6,682.55	32,083.62	6,762.55	58,413.28
1909	2,765.94	34,849.56	3,018.77	61,432.05
1910	12,811.84	47,661.40	15,344.19	76,776.24
1911	1,438.90	49,100.30	999.07	77,775.31
1912	1,229.20	50,329.50	471.64	78,246.95
1913	1,242.04	51,571.54	6,770.38	85,017.33
1914	80.00	51,651.54	2,099.07	87,116.40
1915			2,527.56	89,643.96
1916			600.00	90,243.96
1917	802.64	*52,454.18	3,830.83	94,074.79
1918	241.86	52,696.04	2,449.99	96,524.78
1919	40.00	52,736.04	1,341.61	97,866.39
1920	40.00	52,776.04	2,688.48	100,554.87
1921	0.00	52,776.04	3,355.93	103,910.80
1922	654.62	53,430.66	834.62	104,745.42
1923	1,027.97	54,458.63	1,085.07	105,830.49
1924	958.64	55,417.27	1,443.04	107,273.53
1925	40.00	55,457.27	0.00	107,273.53
1926	0.00	55,457.27	0.00	107,273.53
1927	0.00	55,457.27	719.83	107,993.36
1928	200.00	55,657.27	120.38	108,113.74
1929	719.29	56,376.56	1,595.98	109,709.72
1930	1,880.78	58,257.34	2,120.07	111,829.79
1931	880.00	59,137.34	920.00	112,749.79
1932	0.00	59,137.34	80.00	112,829.79
1933	40.00	59,177.34	40.00	112,869.79
1934	80.00	59,257.34	240.00	113,109.79
1935			502.65	113,612.44
1936	0.00	59,257.34	972.92	114,585.36
1937			80.00	114,665.36
1938	0.00	59,257.34	120.00	114,785.36
1939			160.00	114,945.36
1940	0.00	59,257.34	280.00	115,225.36

*Cumulative values do not account for selections in 1915 and 1916 which were not available.

**Land Board records are based upon two-year intervals.

Table 13—State Parks in Utah

No.	Park	County	Type	Area (acres)
1	Pioneer Monument	Salt Lake		268.56
2	Camp Floyd Cemetery	Utah		40.00
3	Camp Floyd Stage Coach Inn	Utah	Inn	1.53
4	Hyrum	Cache	Reservoir	483.22
5	Scofield	Carbon	Reservoir	2,800.00
6	Natural History	Uintah	Museum	1.66
7	Steinaker	Uintah	Reservoir	820.00
8	Palisade	Sanpete	Reservoir	141.00
9	Dixie-Brigham Young Home	Washington	Museum	.80
10	Dixie-Jacob Hamblin Home	Washington	Museum	4.18
11	Dixie-Snow Canyon	Washington		5,392.51
12	Dead Horse Point	San Juan		4,641.28
13	Goosenecks	San Juan		10.00
14	Indian Creek	San Juan		10.00
15	Monument Valley	San Juan		616.76
16	Fort Deseret	Millard		10.60
17	Old Capitol	Millard	Museum	.59
18	Big Sand Wash	Duchesne	Reservoir	214.51
19	Henefer	Summit		34.03
20	Goblin Valley	Emery		2,240.00
21	Green River	Emery		53.00
22	Wasatch Mountain	Wasatch		21,950.46
23	Yuba Dam	Juab	Reservoir	215.00
24	Minersville	Beaver	Reservoir	1,160.00
25	Anasazi	Garfield		5.95
26	Escalante	Garfield		949.85
27	Coral Pink Sand Dunes	Kane		3,730.00
28	Kodachrome Basin	Kane		2,240.64
29	Bear Lake	Rich	Lake	798.60
30	Otter Creek	Plute	Reservoir	230.00
31	Piute	Plute	Reservoir	2,550.00
			TOTAL	51,614.74

Table 14—National Forest Lands: State of Utah

Year	Area (acres)	% of State
1916	7,447,797	14.13
1920	7,414,696	14.07
1923	7,453,400	14.14
1926	7,481,573	14.20
1940	7,691,378	14.60
1945	7,750,920	14.71
1950	7,787,926	14.78
1955	7,794,816	14.79
1960	7,914,929	15.02
1964	7,890,864	14.97

Table 15—National Forest Lands: Washington County

Year	Area (acres)	% of State
1916	364,638	23.49
1920	368,756	23.76
1923	381,682	24.59
1926	382,590	24.65
1940	388,699	25.05
1945	389,303	25.08
1950	389,303	25.08
1955	389,304	25.08
1960	89,304	25.08
1964	392,696	25.08

